

# American Journal of Orthodontics and Oral Surgery

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MARCH, 1944

# Orthodontics

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ABSTRACTS AND REVIEWS

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VOL. 30

MARCH, 1944

No. 3

## Original Articles

### AN APPRAISAL OF TWEED'S BASIC PRINCIPLES

ALEXANDER SVED, D.D.S., NEW YORK, N. Y.

IN DECEMBER, 1940, Dr. Charles H. Tweed read a series of papers before the Western Component of the Edward H. Angle Society. These papers dealt with "The Application of the Principles of the Edgewise Arch in the Treatment of Malocclusion," and called our attention to a phase of orthodontics which, up to that time, had received little consideration. In less than three years, Tweed's observations were almost universally accepted as correct, and at the present time a very large number of orthodontists follow his teachings with apparent satisfaction and enthusiasm.

This is readily understandable, because the evidence presented is very impressive, and the beautiful results obtained eloquently support the principles employed in treatment. The sincerity with which the entire approach was presented left a deep impression on all of us, and made us feel that, perhaps, we were doing a distinct disservice to our patients in the past. This disturbing feeling was even more intensified by the acceptance of Tweed's teachings by men for whose ability and judgment I have the highest respect. Thus, I reached a state of complete dissatisfaction with my own work, and began the study of the new procedure in detail.

Tweed's work is based upon two outstanding concepts, which differ from the generally accepted diagnostic principles. These are:

1. "That practically all malocclusions are characterized by a forward drift of the teeth in relation to their basal bones." (This is quoted from Dr. Strang's introduction to Tweed's papers in the January, 1941, issue of the *Angle Orthodontist*.)

2. That the mandibular incisors must be placed and maintained in an upright position over the basal bone.

Read before the New York Society of Orthodontics, Nov. 8, 1943.

It is clear that, if these statements are accepted as correct, our methods of treatment must be changed, because the correction of the forward drift of all teeth offers insurmountable difficulties. Very frequently, the extraction of four premolar teeth may become necessary to enable us to reduce the maxillary protrusion. This is often recommended by Tweed and is practised by his followers. As a result, the public is bewildered and anxiously seeks advice against the extraction of the condemned teeth. Just as in the early days of orthodontics, we find ourselves in a controversy over extraction. Some thirty or forty years ago, Angle and Case were engaged in a bitter discussion over this very same question. The controversy is recurrent and comes up in different forms from time to time; but, invariably, the conservative attitude prevails. In this instance, a thorough investigation of the basic concepts also leads to a conservative attitude.

If we examine the first basic statement of Tweed that "practically all malocclusions are characterized by a forward drift of the teeth in relation to the basal bones," the first question which comes to our minds is, "Why should this be so?" From our present understanding of the mechanism of growth, this cannot very well happen. As far back as 1926, Hellman explained that both the mandible and the maxilla grow from "before backwards," and disproved the contention that the face grows forward. Accordingly, additions to the depth of the maxilla are made at the posterior ends of the palate and alveolar processes, and as a result the maxilla is pushed forward. Similarly the mandible grows forward by additions to the posterior border of the ramus and by cutting back on its anterior border. If this explanation of Hellman is correct, it is difficult to understand by what process the upper dental arch is pushed forward in relation to the basal structures. It is even more difficult to explain the anterior displacement of the lower dental arch with respect to the body of the mandible. Here we find an inconsistency between Hellman's explanation of the mechanism of growth, and Tweed's observation that, in nearly all malocclusions, the dental arches are forward in relation to the basal bones. Let us first consider the maxilla. If the maxilla grows forward by new additions of bone at the posterior borders of the palate and alveolar processes, then the dental arches are pushed forward during growth by pressure from behind. This implies some kind of transformation within the maxillary bone itself, because the dental and alveolar arches change their relationship with respect to the zygomatic processes of the maxilla as the individual develops. This transformation must either be an interstitial change or a change along a plane. Histologically, a change along a plane has never been demonstrated, but there is abundant evidence that the change in the maxillary bones is interstitial. Brash conclusively demonstrated that the dental arches grow forward by the forward movement of all teeth through the alveolar processes, and by deposits of new bone over the labial alveolar plates. It is clear then that since, during growth, additions are made to the labial plates, the maxilla actually grows "forward" and not "from before backwards." The movement of the teeth through the bone confirm the fact that interstitial transformation of the maxilla takes place; therefore, Hellman's explanation must be rejected because it is not consistent with conclusively demonstrated facts. Furthermore, the "pressure-from-behind theory" loses its

significance, for the maxillary tuberosities are free and unsupported, and they are incapable in themselves of reacting with sufficient pressure to push the entire dental and alveolar arches forward. The forward tendency is a natural characteristic of all molar teeth and the primary force resides within the alveolar processes and not exclusively in the tuberosities. The change in the relationship of the dental arches with respect to the zygomatic processes of the maxilla during development, is beautifully shown by Zsigmondy. The following illustrations clearly show these changes.

In Fig. 1 the line drawn through the zygomatic processes passes behind the socket of the first deciduous molar tooth. The deciduous central and lateral incisors have not yet erupted. Note the relationship of the posterior border of the palate to the zygomatic line.

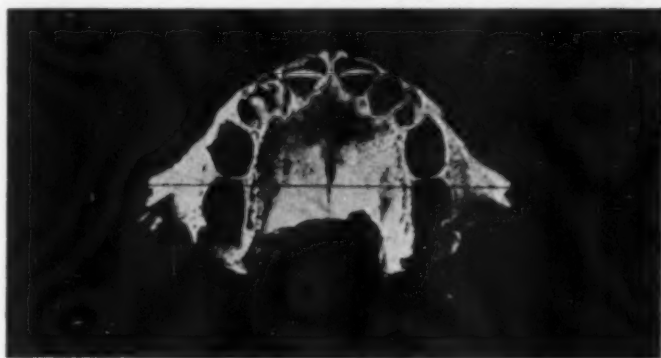


Fig. 1.

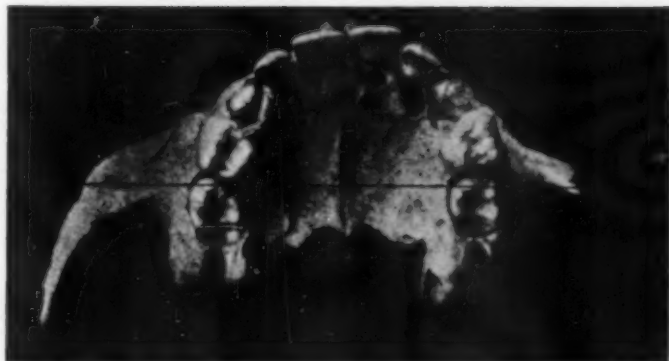


Fig. 2.

Figs. 1-6.—Photographs of the upper dental arch, together with the neighboring parts, to show growth and molding of the bones (Zsigmondy). (From *Festschrift des Vereins österreichischer Zahnärzte*, 1911.) J. Sim Wallace: *Variations in the Form of the Jaws*.

Fig. 2 shows a somewhat later stage. Here all the deciduous teeth are already in position and the zygomatic line begins to enroach upon the second deciduous molars. The distal border of the palate shows about the same relationship as in the previous illustration.

In Fig. 3 the first permanent molars begin to erupt and the zygomatic line passes through the center of the second deciduous molar. Since the distal border



of the palate remains in the same relationship to the zygomatic line as in the earlier stages, we must conclude that, as development progresses, the entire dental arch grows forward.

Fig. 4 shows the first permanent molars in position; although there is no change in the position of the posterior border of the palate, the zygomatic line touches the distal surface of the second deciduous molar. This indicates a further forward displacement of the alveolar and dental arches.

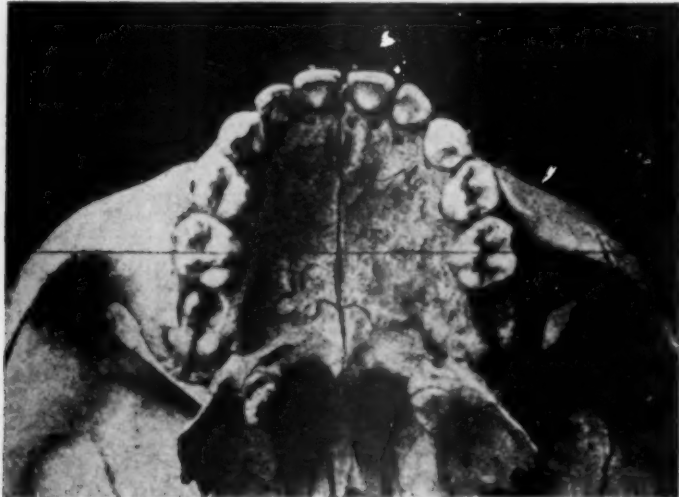


Fig. 3.

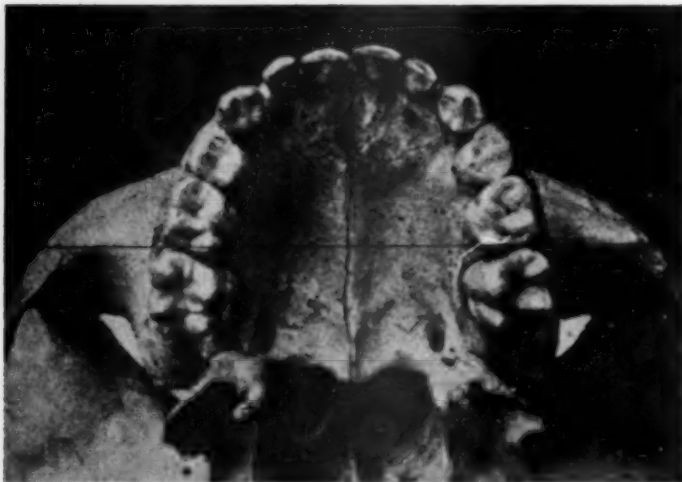


Fig. 4.

Fig. 5 shows a similar stage in which the conditions are the same as indicated by Fig. 4.

Fig. 6 depicts a fully developed maxilla. It shows that the position of the posterior border of the palate does not change appreciably with respect to the zygomatic line. But at this stage the zygomatic line passes behind the first permanent molar tooth.

From these illustrations it can be seen that the alveolar and dental arches grow forward more rapidly than the zygomatic processes of the maxilla. But the alveolar and dental arches belong to the same bone as the zygomatic process.

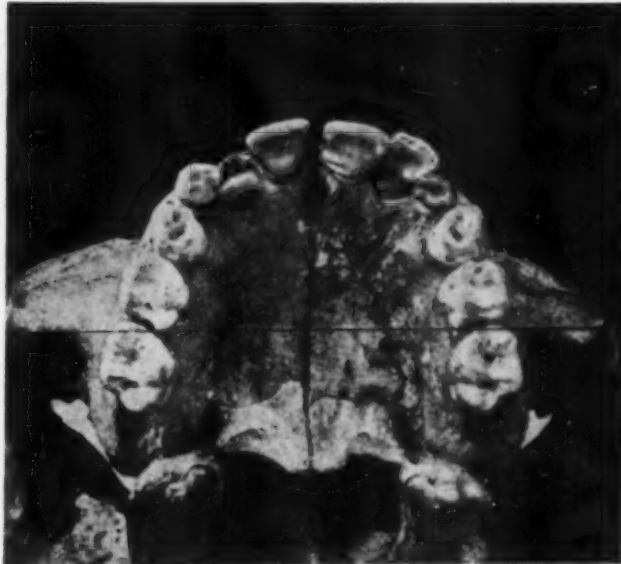


Fig. 5.

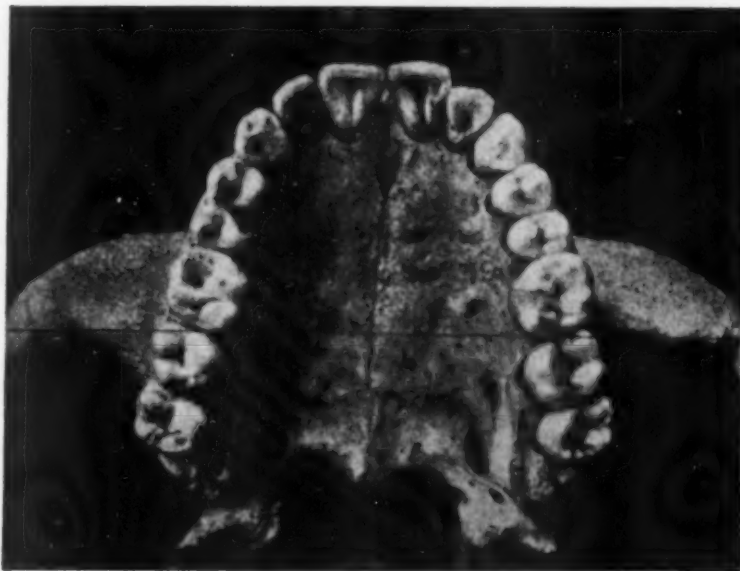


Fig. 6.

Therefore, during development there must be a gradual transformation of the maxillary bone itself to allow the alveolar and dental arches to move into a more forward position in relation to the zygomatic process. This transformation is necessary to accommodate the new dental units as they erupt, and Brash demonstrated that it actually occurs.

Regarding the growth of the mandible, Hellman's explanation is more nearly correct than in case of the maxilla. Brash confirms the statement that the mandible grows forward by deposits of new bone on the posterior border of the ramus and by cutting back at its anterior border. But, in addition, there is also a forward movement of all teeth through the bone and a considerable deposit over the labial plate. This greater growth in the mandible is to compensate for the growth of all the other bones included between the glenoid cavity of the temporal bone and the incisor teeth in the maxilla. Furthermore, this explains why the entire dental arch may be found too far forward in relation to the body of the mandible in many instances.

Thus it appears that Tweed's observation, that "in nearly all malocclusions the dental arches are forward in relation to the basal bones," is correct, and it still remains to investigate whether that condition represents a definite deformity or merely a stage in development.

The face grows gradually from childhood to adulthood. We all recognize that there is a great change from childhood to puberty, but the change from puberty to adulthood is considered comparatively small. This, however, is only approximately true. While the change from puberty to adulthood is much slower than the change from childhood to puberty, nevertheless it takes place and continues into middle age and beyond. In fact, this change is one of the beautiful characteristics of life itself, and it never ceases. The face and the features become progressively coarser, which indicates these changes. The changes in the shape of the mandible from infancy to old age are too familiar to us to dwell upon at length; they are mentioned only to recall the fact that the bones are also involved. From Zsigmondy's illustrations, therefore, we can draw the conclusion that, during growth, the alveolar and dental arches develop at a more rapid rate than the structures which support them. These structures develop at a slower rate under the influence of function, so that, in the normal course of unfolding, they lag behind the vigorously growing alveolar arches. It is not surprising, then, to find that "nearly all malocclusions are characterized by a forward drift of the teeth in relation to their basal bones." According to the evidence just presented that is the relationship in which we should expect to find them. The frequency with which Tweed observed this relationship confirms that this forms part of Nature's developmental scheme, and that it must be considered a normal condition rather than a deformity. And again, if Tweed's explanation is accepted as correct, then it is implied that the alveolar and dental arches are overdeveloped in relation to the supporting structures. This carries with itself the further assumption that the supporting structures are fully developed and the whole deformity is due to an overdevelopment of the alveolar arches. But this is inconsistent with another procedure frequently recommended by orthodontists: the extraction of the third molars. This is recommended with the convincing argument that there is not sufficient space within the alveolar arches to accommodate all the teeth. It is clear that we cannot, in one instance, recommend the extraction of four premolar teeth because the alveolar arches are overdeveloped, and then insist on the removal of four third molars on account of the underdevelopment of the alveolar arches; especially, if they occur in the same patient. And usually they do occur in the same patient, for Tweed's observation

regarding the relationship of the dental arches with respect to the basal structures is correct. The removal of the four premolars in such instances is recommended in preference to the extraction of the third molars, because it is accepted that the crowding in the posterior region is also relieved by that procedure. But the fact still remains that, in such cases, two conditions exist together, one of which is explained by the overdevelopment, and the other by the underdevelopment, of the arches; which, obviously, is impossible.

The only logical conclusion we may draw from all this is that the alveolar arches are almost invariably underdeveloped, notwithstanding the fact that they appear to be in protrusion with respect to the basal structures. Overdevelopment is not the primary cause of the deformities we are dealing with, and we must always look upon the basal structures as lagging behind the alveolar arches in development. When normal occlusion is established by orthodontic means, normal function is also established, and under its beneficial influence the basal bones, in time, will reach their full development. I am fully aware of Tweed's contention that this does not take place, but his appraisal of conditions does not take into consideration the various types coming under our observation. Furthermore, the normal relationship of the alveolar arches with respect to the basal structures at the various developmental levels, as shown by Zsigmondy, are entirely overlooked.

In the adolescent period, all permanent teeth, with the exception of the third molars, are already in position; after that, very little forward growth of the arches takes place in relation to the basal bones. Thus, in adolescents we find an adult set of teeth positioned in a face which is just emerging from the childhood stage and is just beginning to take on adult characteristics. The adult characteristics are not immediately acquired after the completion of the dentition: it takes many more years for the face to mature and to establish the final relationship between the alveolar arch and the basal structures. Protrusions of the dental arches in adolescents are very frequently found, but that must be looked upon as a transitional condition; a degree of adjustment eventually will take place. We must not forget that the face is not static, and that young individuals cannot be judged by adult standards.

It is true that Tweed differentiates between primary or true orthodontics and secondary or adult orthodontics. He states that "we must always bear in mind that as long as growth and developmental processes are available in the patient, there is no justification for the sacrifice of dental units in the treatment of malocclusions. Such a practise should never be resorted to before the complete eruption of the second permanent molars, and even then not until every possible hope of conservative treatment has been exhausted." This, I believe, represents Tweed's most sincere belief, but I disagree with the implication that after the second permanent molars have fully erupted, the growth and developmental processes cease to operate. I am fully in accord with the thought that very little forward growth of the dental alveolar arches will take place after the second permanent molars are in position; but, as it was shown, the basal structures lag behind the alveolar growth and develop later as a result of function, thus reducing what appears to be a maxillary protrusion at an earlier stage.



Even after the eruption of the third molars, the growth of the basal structures continues, and a reduction of the maxillary protrusion can be expected.

The second basic statement of Tweed requires that "the mandibular incisors be placed and maintained in an upright position over the basal bone." This is based upon Angle's statement regarding the dental apparatus, that it is "to be considered as a machine from start to finish, operating on mechanical principles;" and also upon the principle employed in artificial denture work, where



Fig. 7.—A modern Englishman (half natural size). Note the forward movement of 7, and the asymmetry of the palate.

Figs. 7-13 are taken from the Museum of the Royal College of Surgeons of England; N. G. Bennett; published in *The Science and Practice of Dental Surgery*. J. Sim Wallace: *Variations in the Form of the Jaws*.

it is understood that "the teeth must be placed on the ridge if the denture is to be successful." Here, the implication is that, if the lower incisors are not placed on the ridge, the alveolar bone is not able to withstand the incisal stresses, and, as a result, the corrected case fails, terminating either in relapse or in the breakdown of the alveolar bone.



When this concept is applied to an artificial denture, it is readily understandable. In the living, however, the entire lower or upper dentition does not form a single unit separated from the supporting bone, and Nature seems to contradict the statement that the teeth must be positioned over the basal bones for permanence. Especially in the mandible, neither the anterior nor the posterior teeth are placed directly over the ridge, and it seems that one of the important functions of the alveolar bone is to build out a ledge from the base to give support to those teeth which are not positioned directly over the ridges. This is



Fig. 8.—Ancient Egyptian (female), predynastic (4000-6000 B.C.), (half natural size). Note the well-developed arches and the marked attrition of the teeth.

frequently quite prominent in the anterior region, and often very marked around the third and second molar teeth. The extent of the "building-out" of the alveolar processes depends upon the type of the individual. The extreme types may best be demonstrated by the differences existing between various races, and these variations with limitations can be found within any one race. The purpose is to show that one of the functions of the alveolar bone is to give support to the teeth regardless of the relationship of the teeth to the basal bones, and that

normally the lower anteriors may or may not be situated directly over the bony ridges. To show the many variations which may be considered normal in different races, Figs. 7 to 13 were taken from N. G. Bennett, with remarks by J. Sim Wallace.



Fig. 9.—Negro (half natural size).

Fig 7, Modern Englishman. "If the position of the dental arch on the lower jaw is observed by looking straight down on the teeth and jaw, it will be seen that in the case of the modern Englishman, the bone of the chin is to a large extent placed well in front of the dental arch."

Fig. 8, "In the case of the ancient Egyptian, the incisor teeth viewed from a similar standpoint show about an equal amount of bone in the region of the chin before and behind these teeth."

"In the case of the Negro (Fig. 9), the Chinese (Fig. 10), the Bushman (Fig. 11), the Tasmanian (Fig. 12), and the Sandwich Islander (Fig. 13), the arch formed by the incisor and canine teeth is placed wholly in front of the bone of the mandible in the region of the chin. It will thus be seen that the position of the arch of the lower jaw varies, as does the upper, with relation to the body of the jaw in which the dental arches are placed."



Fig. 10.—Chinese (half natural size). Note the extra width of the arches.

These plates indicate that in the various racial types the alveolar bone is able to support the teeth in normal relation, even though the dental arch is positioned so that the anterior teeth are in front of the body of the mandible. But these illustrations further indicate that, normally, the posterior teeth are also set off the ridge. In the case of the modern Englishman, both the anterior teeth and the posterior teeth are located lingually to the main body of the bone. The third molars are absent, but it is clearly shown that the alveolar process is built out lingually to support the second molars. The plate of the ancient Egyptian more nearly causes us to conform to the notion that the teeth must be

placed well over the basal bones, but even in this case the alveolar process is built out lingually around the third molars. In the case of the Negro, the Chinese, the Bushman, the Tasmanian, and the Sandwich Islander, the anterior teeth are in front of the main body of the bone and the posterior teeth are lingually situated. In no race do we find that all the teeth are placed directly over the basal structures. This conclusively proves that the alveolar processes are able to withstand the functional stresses under diverse conditions, and that the placing of the mandibular incisors in an upright position over the basal bones cannot be the most important requirement of successful orthodontic treatment.



Fig. 11.—Bushman (half natural size). The arches are small compared with others shown, but the Bushmen are a small race.

Another important point may be stressed in this connection. The uprighting of anterior teeth during treatment is often necessary and desirable, but when it is carried too far, it is one of the most harmful procedures. Here, again, it is believed that unless the anterior teeth in all treated cases have the same axial inclinations, failure is sure to be the result. In a recent study conducted at the



University of Illinois, it was shown that teeth resume their original axial inclinations after orthodontic correction. It is well for us to remember that there is just as much variation in the axial inclinations of the anterior teeth as there is in any other part of the human body. The setting up of fixed standards will limit our vision, and definitely hinder further progress.



Fig. 12.—Tasmanian (half natural size). Note the well-developed but nearly parallel-sided arches.

We frequently accept statements because they appear to be correct, and seldom inquire whether the acceptance of that statement is justifiable. To illustrate how easily this may occur, let us take the question of the third molars. We may take any other question about which we have fixed notions, but the third



molar is most frequently condemned for extraction, and perhaps, the following considerations may save many third molars which may otherwise be extracted. If we examine the photograph of the mandible in Fig. 14, we will note that the alveolar process is built out lingually under the second and third molar teeth.

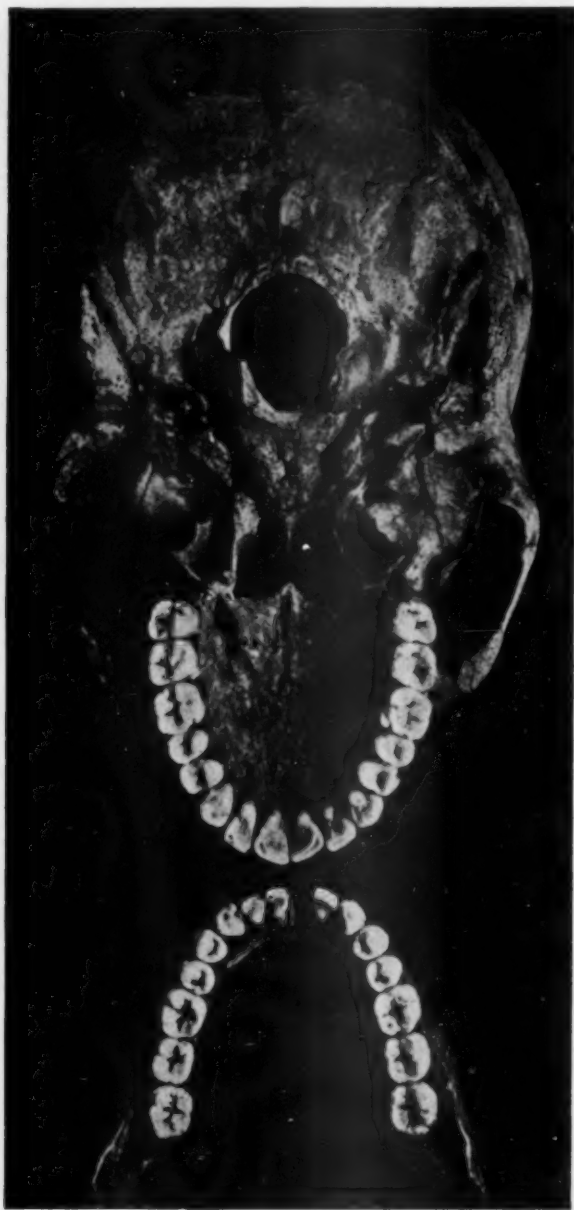


Fig. 13.—A Sandwich Islander (half natural size). Note the well-developed arches.

This indicates that these teeth are not set directly over the ridge, and that both rami are lateral to the dental arch. If distal movement of the posterior teeth is required during orthodontic treatment, then the rami cannot possibly offer the slightest resistance; and if mechanical appliances were able to produce distal movement, the teeth could be moved as far back as we wished. The resistance

to distal tooth movement originates in the alveolar processes, and the mandibular rami have nothing to do with it. When a tooth is so malposed that it is found directly in the ramus, it is also situated outside of the dental arch. Thus, the acceptance of the statement that usually there is not sufficient space in front of the ramus to accommodate the third molar is based only on radiographic evidence, which may be misleading. If the relationship of the lower dental arch to the mandibular rami is taken into consideration, the removal of the third molars to enhance corrective procedures will be reduced to a minimum. This

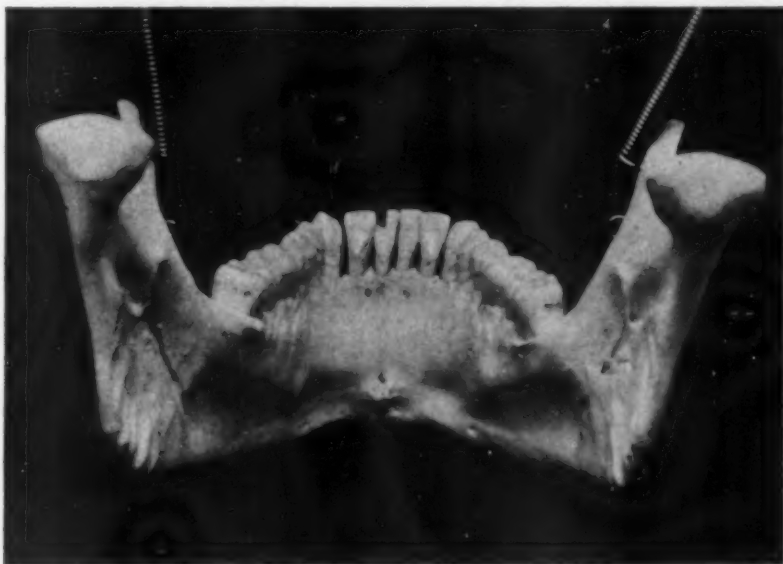


Fig. 14.—Lingual view of a mandible showing the building-out of the alveolar process to support the molar teeth.

conclusion is fully in accord with the findings of Broadbent, who found that the third molars do not affect the alignment of the teeth. In his article on "The Influence of the Third Molars on the Alignment of the Teeth" in the June, 1943, issue of the *AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY*, Broadbent says, "Factual evidence collected by the Bolton study for the past twelve years would acquit the wisdom teeth of the 'fifth column' charges and include them along with the incisors as cosufferers resulting from the failure of the facial skeleton to attain its complete adult size and proportions." Dr. Pollock comments editorially on this statement in the same issue. This is a timely and important statement, and it supports in every detail the arguments presented in this paper to show that the apparent protrusion of the dental arches in relation to the supporting structures is a transitional condition, and that Tweed is in error when he considers that condition an abnormality. If, with this background, we examine Tweed's evidence (Fig. 15), which shows a case before treatment, during retention after treatment without the extraction of the first premolars, and the result of retreatment after the removal of the first premolars to improve facial balance and harmony, we will note that the result of the first treatment is a definite improvement in facial balance over the untreated case. This is im-

portant, because orthodontic treatment usually increases maxillary protrusion temporarily. Yet, without extraction, we find an improvement, notwithstanding orthodontic interference. In the appraisal of photographs of this type, we invariably forget the element of time. It is clearly seen that, in the case presented, the patient was still in adolescence after the completion of the first treatment, and traces of bimaxillary protrusion are present. But the question arises whether further development would not have corrected this, and, also, whether retreatment with the extraction of four perfectly good teeth was at all necessary.



Fig. 15.—Upper photographs made at the beginning of treatment. Center photographs taken when case was retained, without extraction of first premolar teeth. Lower photographs show result of retreatment after the removal of premolars to improve facial balance and harmony. Tweed: Angle Orthodontist 11: 1941.

It is certain, however, that the presence of a complete set of teeth up to some stage of adolescence was beneficial to this patient, and that the basal structures had a chance to develop. It would be very instructive to add another set of photographs of this patient ten or fifteen years after the completion of the re-treatment.

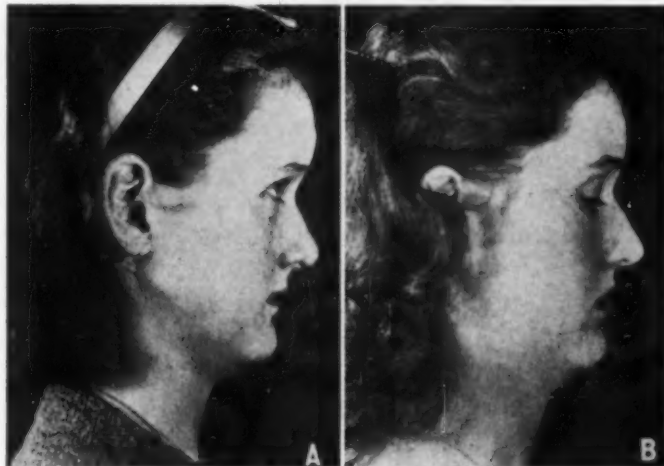


Fig. 16.—Profile photographs taken at 13½ years (A) and at 18½ years (B) of a young lady with congenital absence of all four second premolars. (From Broadbent: *Am. J. Orthodontics and Oral Surg.* 29: 328, 1943.)

The effect of the congenital absence of four second premolars is shown by Broadbent (Fig. 16) in profile photographs of a patient at 13½ and 18½ years of age. Here, the underdevelopment of the alveolar arches is clearly recognizable, and while we are dealing with an entirely different type of individual, the teeth do not seem to be in protrusion in relation to the basal structures. It is evident that in contrast to the previous case, both the alveolar arches and the basal bones are underdeveloped. The removal of four teeth from the mouth may have other effects, which, at the present stage, we are not in a position to judge. It is certain that, by that procedure, we disturb those forces which have something to do with interproximal contact. The intra-alveolar forces cannot exercise their full influence, and thus we may establish a condition conducive to periodontal disease. We have no data to prove that this will be the result, but in about ten or fifteen years we can expect to have information on this point.

An editorial entitled "A Common Purpose" appeared in the July, 1943, issue of the *AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY*. In it, Dr. Pollock says: "A mutual interest, or even a mutual enemy, psychologists know, is a powerful influence to bring human beings together. Many are now asking if there are not signs in the wind that point to the conclusion that the period of intensive orthodontic mutual interest is passing. Plainly it is going through a transition period and quickly changing into a status of cliques, or groups, who find that their mutual interest is more sharply focused on some particular mechanical device, somebody's particular concept of the orthodontic problem, or something equally arresting to focus sharp attention, as contrasted to the perspective of the entire field."



"A breakdown or division of orthodontic interest seems to be present. It is all happening so rapidly and is marked by such divergent viewpoints that it is not only confusing, but almost paradoxical in its implications. If you were an orthodontist, you would no doubt answer that observation by saying, 'so what,' that's not new.' It has always been so, and many regard such a situation as a healthy sign. The answer would probably be, 'But opinion among many leading authors and workers in the field is so hopelessly divergent in some of the very grass roots of the subject that, to say the least, clarification is badly needed. Such a situation does not inspire the confidence that is the foundation of progress.'"

He further says:

"Time alone will answer many questions, and while time is elapsing it is well to remember that of the things orthodontists were doing twenty-five years ago in the way of treatment, few are being done today. No matter how sure you are that you are on the right track today, the chances are that history will repeat itself, and you will change many of your orthodontic thoughts next year, or the next, or some time thereafter.

"Perhaps the screening and selection process, as used so successfully in the Armed Forces in order to select those best qualified for a particular job, might be a part of the answer, at least to contradictory orthodontic problems. That is to say, controversy as to methods notwithstanding, screen out opinion by a process of elimination, be realistic, and ascertain how to correct malocclusion by the best and most realistic methods possible."

This is the best advice that can be given to anyone, and perhaps the organized profession should say something about the acceptability of the various orthodontic concepts and methods of treatment which differ from the generally accepted procedures. Some arrangement should be made whereby the papers read before orthodontic societies are evaluated and correlated with the existing knowledge. There are too many conflicting opinions which require clarification.

#### SUMMARY

1. Hellman's explanation of the mechanism of the growth of the face should be re-examined. According to reliable evidence, the face grows "forward" and not "from before backwards."
2. During development the alveolar processes and the dental arches grow forward more rapidly than the zygomatic processes of the maxilla.
3. The basal structures giving support to the teeth continue to develop gradually under the influence of function, after the completion of the adult dentition.
4. Nearly all malocclusions are characterized by an apparent forward drift of the teeth, but that condition is transitional.
5. The forward tendency is a natural characteristic of all molar teeth.
6. Young individuals cannot be judged by adult standards.
7. There is a normal variation in the formation of the jaws between the various races; and also in the relationship of the dental arches with respect to the supporting structures.
8. As a rule, neither the anterior nor the posterior teeth are placed directly over the ridges.

9. The arrangement and maintenance of the lower anterior teeth in an upright position over the basal bone is not a requirement for permanent orthodontic results.

10. There is a great variation in the normal axial inclination of the anterior teeth in different individuals.

11. "Axial inclination of the teeth disturbed by orthodontic management, tends to correct itself following treatment." (Brodie.)

12. The extraction of four premolars for supposedly improved orthodontic results is justifiable only in very few instances.

13. The extraction of third molars is recommended too frequently.

14. Some arrangement should be made whereby papers read before orthodontic societies are evaluated and correlated with known facts.

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#### DISCUSSION

*Dr. Sidney E. Riesner, New York.*—The interesting inquiry into the components and characteristics of the intensely spotlighted principles of treatment as recommended by Dr. Charles H. Tweed of Tucson, Arizona, proceeds at an accelerated tempo.

It is a method daring to the point of annoyance, because it confronts and questions your complacency in being satisfied with uncertain futures for your orthodontic treated cases. It is understandable why Dr. Sved "reached a state of complete dissatisfaction with his own work," but in his evaluation of Dr. Tweed's principles, his analysis fails.

On the two main themes he has selected from Dr. Tweed's work, Dr. Sved discourses, pacing the corridors of his mind, only to come to a blind alley when he is confronted with the overwhelming clinical evidence shown by Dr. Tweed and those who emulate his teachings. The fact remains that orthodontists, practicing the guiding principle of placing the teeth over basal bone, and uprighting teeth with abnormally forward inclined axial positions, are producing excellent results that are standing up under the test of time.

These precepts are necessarily disturbing to the conscientious practitioner not employing them, who reflectively reviews his efforts and results in an honest and detached appraisal, and finds them wanting.

Dr. Hellman's work was cited to prove it difficult to understand "by what process the upper dental arch is pushed forward in relation to the basal structures." That is readily explained when you consider, as shown by Dr. Strang in the new edition of his textbook, that "the tuberosity of the maxilla [which Dr. Sved says is free and unsupported] is backed up by the pyramidal process of the palatine bone and this process in turn rests against the pterygoid processes of the sphenoid bone. Consequently, any growth that takes place antero-posteriorly on the tuberosity of the maxilla cannot go backward but must act as a wedge, and move the body of the maxilla forward. And that is just what occurs, for, as this growth of the tuberosity takes place for the purpose of furnishing room on the dental arch to accommodate the next molar tooth in line, the face swings forward and away from its cranial base. This forward movement occurs with the eruption of each molar tooth.

"In addition to this, there is some surface addition to the alveolar process overlying the incisor and canine roots."

This explanation of the process of evolution of the human "muzzle," as far as the maxilla is concerned, is not an opposite opinion of what Dr. Hellman contends. Last week in a personal conference with Hellman, he advised me, to the contrary, that the above is the explanation which he approves. This is probably why Dr. Sved rejects Hellman's findings a little later on. But it hardly proves Dr. Hellman wrong if an erroneous interpretation is placed on his work.

W. M. Krogman's summary from Hellman's statistics, as reported in Dr. J. A. Zalzmänn's excellent new book *Principles of Orthodontics*, indicates that this transitional position of the denture forward of its natural relation, has not much chance of realizing an adjustment through function. "In the first five years, 78 per cent of height, 85 per cent of width, and 82 per cent of depth have been achieved. This means that after 5 years of age, only 15 to 20 per cent of growth increments remains as avenues of possible readjustments."

It is hardly fair to ask us to accept as evidence the offering of a single illustration, and draw a generalization from it, or to offer as "evidence" an opinion that is an evaluation of someone's work.

We heard Sved advocate: "The alveolar arches are underdeveloped." This was followed by the statement, "the basal structures are lagging behind the alveolar arches in development." Therefore both structures are underdeveloped. The ultimate correction of this deficiency Sved believes, will take place "in time" after a normal intercusping is achieved under the beneficial influence of "normal function."

If two conditions exist together that are "obviously impossible," as Dr. Sved admits, one of the conditions must be evaluated wrongly. Sved attributed this to type, rather than admitting as orthodontic failures those cases where basal bone does not catch up with the forward position of the denture as placed there by the orthodontist. When Dr. Tweed recommends the extraction of four premolars in those cases of malocclusion known as bimaxillary protrusion, he does so to permit him to retract the six anteriors over basal bone, because they have drifted forward, not because there was an overdevelopment of the bone. Therefore, when extraction of third molars is recommended, there is no connection with the aforementioned procedure, but rather a correction of the crowding condition in the third molar region that was induced by the lack of a full realization in development of the mandible.

Sved acknowledges that "Tweed's observation regarding the relationship of the dental arches with respect to the basal structure is correct. The removal of four premolars in such instance is recommended in preference to the extraction of the third molars, because it is accepted that the crowding in the posterior region is also relieved by that procedure." "Typal" forms do not realize a developing basal bone under the "beneficial influence of function." Hellman, Brodie, and Broadbent have shown convincing work that the original developing pattern of basal bone is not changed after its initial presentation of early childhood.

In considering the evaluation of Zsigmondy's work, are we justified in believing Sved's opinion "that during growth the alveolar and dental arches develop at a more rapid rate than the structure which supports them"? Bone can and does grow radially to carry posteriorly even the measuring base line that passes through the zygomatic processes. In fact it is an entirely different evaluation that Zsigmondy himself places on the evidence of these same pictures that Dr. Sved showed. Wallace, in his book, specifically states, "The gradual moulding and backward translation (in relation to the teeth) of the malar process and zygomatic arch were clearly brought out by O. Zsigmondy in 1911. The line through the malar process in the six different year periods indicated, shows very distinctly the change in relation to the teeth." You could not have it stated any more precisely than that.

It does not carry with it the assumption that "the whole deformity is due to an overdevelopment of the alveolar arches." The teeth are forward of their basal bone because of forward translation.

The angle of projection of the plates borrowed from N. G. Bennett are certainly too uncertain a basis for "conclusive proof" for the generalities drawn from one skull of an entire race. The specimens selected, except the Englishman, did not show any malocclusion, which is a basic factor in the matter with which we are presently concerned. The English-

man's skull showed only one maxillary premolar and no mandibular second molar on the right side. The readjustment of these teeth on the ridge tends to support Tweed's opinion. Dr. Tweed does not recommend changing so-called normal occlusions so that all teeth are uprighted. He would not recommend changing a Negro conformation to that of a Caucasian type. However, he finds that in arranging teeth in *malocclusion* for their correction, if they are uprighted and repositioned over basal bone, they are more stabile and enduring. The "normal" will not be forward of its basal bone. It is only the abnormal, the malocclusion, that is brought to the orthodontist for correction, subject to the vicious forces that produce a forward migration of dental segments.

The lingual extension of the mandible as mentioned by Dr. Sved (Fig. 14), is not the result of functional stress of mastication, but rather the bony shelves and ridges for muscular attachment. Contrary to the conclusion drawn, the buccal or cheek teeth are situated over the bony base in the axial direction of their stress.

The statement is unsubstantiated "that if the anterior teeth are uprighted or brought back too far, it is one of the most harmful procedures." Where has this been demonstrated in logical types of treated cases? Of course, anything in excess is unhealthy.

If, as it was argued, "the apparent protrusion of the dental arches in relation to the supporting structures is a *transitional* condition," at what age can we expect to see the permanent and mature form of dental arches, and are there any progressive records that could show it?

If, as stated, "forward drift" is a normal condition of a developing pattern that realizes its definite form in maturity through function, should we defer and reserve orthodontic correction until adulthood?

If Sved feels that development will take place in the basal bone if orthodontic treatment places the teeth in so-called normal cusp and surface relation, why does he find the "uprighting of anterior teeth during treatment is often necessary and desirable." When does he employ it, and how far is he willing to go with it? Why is it right in one instance and wrong in another?

When the University of Illinois study was made, the axial inclination correction of placing teeth upright over their basal bone was not employed. The fact that Brodie found the collapse and failure of position of orthodontic treated cases indicates that, even though the teeth are in so-called normal cuspal relation, function cannot be the salvation of the case, nor will eventual development occur, but rather, collapse will ensue.

The only results Dr. Sved quoted as failures were those reported by Brodie. In not one single instance was a case of so-called bimaxillary protrusion of the young developmental arch reported that was spontaneously corrected through function. The reason for this is obvious. The forces that were operating to produce the anomaly of the developing arch kept right on to complete the collapse of the unstable mechanism in the mature arch.

The comments of Dr. Sved on the results of Dr. Tweed, as seen in the second part of Fig. 15 of a treated case without resorting to extraction of premolars, is more a tribute to the ability of the mechanical skill of Dr. Tweed than a plea for following this plan of treatment. Because, in the opinion of this most accomplished operator, this "acceptable" result is unsatisfactory because it is unstable, and without balance and facial harmony. Dr. Tweed has seen what were the results of this type of treatment. Almost every one of you can demonstrate identical results in your own practice, in a critical review of your cases when seen five or ten years after active treatment. This principle of recognizing the dental arches forward of their basal bone is incorporated in all the contemporary "systems" of treatment and is a universally recognized truth by all the schools of thought.

This is not a principle new to this generation. Dr. Grieve's early thinking and practice on this subject entitles him to a great deal of credit for his pioneer work seventeen years ago in helping treated cases like this.

Dr. Calvin Case was eminently successful in his time, practicing these principles to maintain the stability of the treated denture base through extraction. Lundstrom recognized the insecurity of attempting to develop an arch on a crowded foundation. The great surgeon, Dr. Cryer, of Pennsylvania, has thought through the same problem after a rich clinical life, and concurs with the practice of eliminating dental units in maintaining dental orthopedic



results in stabile form. He states: "Many writers, especially of late (1920), claim that irregularities of the teeth should always be corrected without the extraction of one or more teeth, as 'Nature never puts teeth into a mouth that do not belong to that physiognomy.'"

"Your writer thinks this is doing Nature a great injustice. Many teeth are found in the mouth which should be removed, not only for correction of irregularities, but for the general comfort and health of the patient. Modern civilization demands that we live contrary to, rather than in accordance with, Nature, and so long as this is so we cannot blame Nature for existing irregularities, or depend upon her entirely for beneficent results. Our numerous dental and medical colleagues testify to the necessity of assisting Nature to become reconciled to modern methods of living."

Permit me to say that it is unfortunate that a critical review of the Tweed philosophy, which was formulated from the wealth of clinical evidence and outstanding orthodontic results he has shown, should not be substantiated by at least a few clinical cases treated on the theory of moving teeth off their basal bone. This would be much more convincing than specious argument.

When an essayist attempts to present scientific or analytical data to support his arguments, fallacious though they may be, it is a procedure that commends professional attention. However, when he offers an emotional plea to combat a scientific system, it falls of its own weight.

The argument that we should all think alike, so as to present a common front, is hardly justifiable in this enlightened age. Men of original thought like Columbus, Newton, Pasteur, and Einstein, all had to abandon accepted fallacies of their time, because the truth beckoned to them to advance. We can hardly reject Tweed because he leads us into new ways of thought. Orthodontists employing Dr. Tweed's principles may not have the fine spun supporting theories currently for their work, but they are producing mounting clinical evidence that is convincing and impressive, and time will justify their procedures and confidence in the Tweed philosophy.

In closing with Dr. Sved's summary, I present the following:

1. The point about Hellman's explanation of the mechanism of growth hardly needs to be re-examined, because Dr. Hellman does not claim that the face grows as Dr. Sved has stated.
2. Dr. Sved has evaluated Zsigmondy's work in opposition to Wallace's and Zsigmondy's own interpretations.
3. There has been no basis of proof that basal structures continue to develop gradually under the influence of function after the completion of the adult dentition.
4. The acknowledged forward drift in malocclusion is not transitional, but definitive, as seen in the same condition in the adult form. There has never been any proof of any spontaneous correction of this type of malocclusion.
5. We agree that growth tendency of the teeth is in a forward direction.
6. Young individuals should not be judged by adult standards, but when we recognize malocclusion in young individuals that we know will grow progressively worse in the adult, corrective therapy may be employed.
7. It is agreed that normal variation in jaw form occurs in various races. Typal form must be recognized in treatment.
8. We must not misinterpret the presence of ridges that are essentially for muscular and ligamentous attachments, as support for teeth off the basal bone.
9. Dr. Tweed has shown that orthodontic results are more stable when the lower anterior teeth are uprighted and positioned over basal bone.
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12. If extraction of premolars is justifiable in some instances, why do not the same principles apply in other cases?

13. I agree that the extraction of third molars is recommended too frequently.

14. The effort to evaluate and correlate with known facts, papers that were read before orthodontic societies, is made in this rebuttal.

*Dr. Sved.*—It gives me great pleasure and satisfaction to be able to answer Dr. Riesner's discussion in detail. The reason for this extended answer is not to indulge in personalities, but rather to clear up some of the fallacies which have rooted themselves in the minds of some of our outstanding orthodontists, and which are perpetuated just because they happen to be in print, or because someone with sufficient authority said so. It is important to make a clear-cut issue of this at this time, because orthodontics is passing through a critical period and the specialty will be discredited unless the influence of our misguided enthusiasts is checked.

The first question taken up by Dr. Riesner is the statement made by Hellman that the maxilla grows from "before backward." It is believed that this can be readily explained by the fact that "any growth that takes place anteroposteriorly on the tuberosity of the maxilla cannot go backward but must act as a wedge and move the body of the maxilla forward," and, in addition to this, there is some surface addition to the alveolar process overlying the incisor and canine roots. It is claimed that I placed an erroneous interpretation on Hellman's work. To answer this, I quote the following from my own paper: "As far back as 1926, Hellman explained that both the mandible and the maxilla grow from before backward, and disproved the contention that the face grows forward. Accordingly, additions to the depth of the maxilla are made at the posterior ends of the palate and alveolar processes, and as a result the maxilla is pushed forward."

There is no substantial difference in Dr. Riesner's and my own interpretation of Hellman's explanation, except that it is believed that I do not admit that the maxilla can move forward under such circumstances. It is interesting to note that I am perfectly in accord with that belief, and that I offered a more acceptable explanation of the forward growth of the maxilla in 1935. Hellman arrived at his conclusions by drawing an analogy between the forward growth of the mandible and the maxilla. It is very clear that the bulk of the anteroposterior growth of the mandible takes place at the posterior border of the ramus and the condyle. As a result of this the mandible is pushed forward. There is also a considerable deposit over the anterior alveolar plates and the teeth move forward through the bone. Now we must take into consideration the fact that the mandible is a detached bone, and growth can take place in this manner. Hellman explained the growth of the maxilla on the same basis and maintains that the deposits are made at the posterior border of the palate and alveolar processes and thus the maxilla is pushed forward. On a superficial consideration, this explanation may appear to be sufficient, but if we further inquire into the mechanism of growth, we shall encounter many difficulties.

1. The maxilla is not made up of detached bones like the mandible and before they can be pushed forward by deposits from behind some transformation of the maxilla must take place. These transformations must be explained in detail because it is not quite as simple to understand the forward swing of the maxilla, as that of the mandible. This explanation was not given by Hellman.

2. There is no proof that the sutures are the sites of growth, in fact Brash showed that the deposits in the sutures are not greater than on the exposed surfaces.

3. If the maxilla is pushed forward from behind, how can we explain the forward movement of all teeth through the bone as development proceeds? Furthermore, why should there be such a heavy deposit over the labial alveolar plates if the jaws are pushed forward from behind? If Hellman's explanation is correct, this would not take place.

4. If the maxilla is pushed forward from behind, how can we explain the different rates of forward growth of the alveolar processes and the basal structures? To say that the deposits at the ends of the alveolar arches are greater than at the distal border of the palate is not sufficient because that brings up the next question: How does the alveolar arch leave the basal bone behind in its development? How can it happen?

5. Brash demonstrated that the growth of the bones of the head takes place by surface deposits and absorption and additions to the free edges. Why should there be a special arrangement for the anteroposterior growth of the maxilla? And why should we assume

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that it is necessary to have an excessive growth in the sutures in this one particular instance? It must not be forgotten that the growth of the mandible is entirely due to surface deposits and absorption. There is no proof to substantiate Hellman's statement that those deposits in the sutures occur, and there is no proof that tuberosities are the main sites of growth in the maxilla.

6. From the reinterpretation of Hellman's measurements (using his figures), the conclusion was drawn that the maxilla cannot be pushed forward by deposits from behind, and the following statement was made, which explains the proper forward growth of the maxilla:

"First of all, the first permanent molar is not the only tooth which moves forward through the alveolar bone during growth. This was shown to be a general condition with all teeth, including the anterior teeth. There is a definite deposit of bone on the labial surface of the alveolar process supporting the anterior teeth; so the curve of the alveolar arch depth in the first molar region shows only the relative rate of forward movement between the first molar and the anterior teeth. The forward movement of the other teeth confirms the conclusion that the first molar moves forward at a much greater rate than the curve indicates. Second, it was pointed out that growth cannot be demonstrated in sutures. These correlated facts point to an error in Hellman's explanation, and the curve confirms Brash's deductions that the jaws grow forward by surface depositions and absorptions. Thus, the entire dental arch moves forward through the alveolar bone, and, when the first permanent molar erupts, it takes a position behind the second deciduous molar. As a result of the general forward tendency by the time Stage IV is reached, the first permanent molar moves forward far enough to take the position originally occupied by the second deciduous molar, or, in many instances, to a more forward position. There is comparatively little increase in the posterior palate depth during the entire span of life, but it is sufficient to accommodate the second and third permanent molars, which erupt at a later stage."

Just what objection is made to this explanation is not quite clear, but it seems that it is not accepted. It is in conformity with the growth of the other bones of the face and at the same time it explains how the alveolar arch can move forward at a more rapid rate than the basal bones. Furthermore, it supports the well-established fact that the teeth have a forward tendency. This statement was accepted by Dr. Riesner without reservation, without considering that it is not consistent with Hellman's deductions. And again, it gives a complete account of the transformations which must take place when the growth changes occur.

I regret that I have to call attention to the arguments Dr. Riesner presented to support Hellman's deductions. It is claimed that I placed an erroneous interpretation on Hellman's work, and to prove this, Dr. Riesner consulted Hellman on this question. Personal consultation with Dr. Hellman cannot be admitted as carrying any weight, because one of Dr. Hellman's own statements is under investigation. The mere fact that Strang repeats Hellman's statement does not prove its correctness. There was not one acceptable argument or proof presented in the discussion to support Hellman's work. Regarding the tuberosity of the maxilla, I suggest that its relationship to the pyramidal process of the palate bone and to the pterygoid process of the sphenoid be studied on skulls. It will become clear at once that the tuberosities are free and unsupported. This requires no further comment.

Perhaps I did not make quite clear in my paper why Hellman's conclusions had to be included and carefully studied. This became necessary to give an explanation of the condition to which Tweed directed our attention. He pointed out that all malocclusions are characterized by a forward drift of the teeth in relation to their basal bones. Now it is obvious that if Hellman's explanation of the growth of the maxilla is correct, the condition observed by Tweed cannot occur. As I have stated in my paper, I concur with Tweed's opinion; therefore, I had to call attention to the widely accepted explanation of Hellman, to show that the two opinions are inconsistent. If the followers of Tweed insist that Hellman's explanation is correct, then they must give an account of the discrepancy between the rate of growth of the alveolar arches and the basal bones.

Dr. Riesner is right in quoting from my paper that, in most malocclusions, both the alveolar arches and the basal structures are underdeveloped. He further quotes that I believe that during the comparatively rapid orthodontic correction the basal structures are left behind and so-called bimaxillary protrusion is produced. This is my sincerest belief, and there are

many cases to prove that this occurs. This condition is looked upon with alarm by Tweed, and, in order to avoid it, he recommends the extraction of four sound teeth. Here a difference of opinion exists. I maintain that the basal structures eventually adjust themselves, and a normal relationship between the basal and alveolar structures results. Tweed, on the other hand, maintains that this will never occur, and in order to establish harmony we must resort to extraction. The showing of cases in this connection is meaningless because the standards by which the cases are to be judged vary. Furthermore, a number of cases can easily be found to demonstrate any point we wish to bring out. Tweed announced that in normal occlusion the lower anterior teeth must be placed in an upright position over the ridge. There is no proof to substantiate this statement, and if that standard is adopted, nearly all cases would appear to be in protrusion. Thus, in the absence of a dependable standard, our judgment would be conditioned by the distinctive type of case we wish to establish. Therefore, those who judge cases according to Tweed would find many more cases of bimaxillary protrusion than those who depend on more conservative standards. When I first began to study Tweed's ideas, by using his standard nearly every case in my practice appeared to be in protrusion. The prevalence of this condition, and the frequency of its occurrence, indicates that the condition pointed out by Tweed is not an abnormality, and that it represents the average which, in this case, must be considered the normal. If bimaxillary protrusion appeared only in a very low percentage of cases, then Tweed's interpretation and recommendation may be justifiable.

In the evaluation of Zsigmondy's work, Dr. Riesner questions the acceptance of the statement that "during growth, the alveolar and dental arches develop at a more rapid rate than the structures which support them." He says that "bone can and does grow radially to carry posteriorly even the measuring base line that passes through the zygomatic processes." To confirm this, Wallace is quoted as follows: "The gradual moulding and backward translation (in relation to the teeth) of the malar processes and zygomatic arch were clearly brought out by Zsigmondy in 1911. The line through the malar process in the six different year periods indicated, shows very distinctly the change in relation to the teeth." Here Dr. Riesner underlined two words, "backward translation," to indicate conclusively that even Zsigmondy and Wallace are of the same opinion as he is. He failed to note, however, that immediately after the words he underlined there is a parenthesis in which it is explained that the backward translation is in relation to the teeth and not in relation to the skull. In order that the measuring base line may be carried posteriorly as he contends, the zygomatic line must be pushed backward in relation to the skull and not to the teeth. This makes a great deal of difference, and Wallace was very careful to state what he meant.

In the next paragraph, Dr. Riesner cannot agree that, if Tweed's conception is accepted as correct, the malocclusion or deformity is due to an overdevelopment of the alveolar arches. He says that "the teeth are forward of their basal bone because of their forward translation." Here it is implied that the teeth are too far forward, but this immediately means that the alveolar bone is too far developed anteriorly to support the teeth, and if that is the case, there must be an overdevelopment of the alveolar arches. If the basal bones are behind in development to the alveolar arches, then any of the following conditions may prevail.

1. Basal bones are underdeveloped and the alveolar arches are normal.
2. Basal bones are normal and alveolar arches are overdeveloped.
3. Both the basal bones and the alveolar arches are underdeveloped.
4. Both the basal bones and the alveolar arches are overdeveloped.

The correction of the first case consists of aligning the teeth and then waiting for the basal bones to develop. But according to Tweed, this will never occur; therefore, the extraction of four premolars is recommended to reduce the alveolar arches in order to bring about harmony with the underdeveloped basal bones.

The correction of the second case consists of reducing the alveolar overdevelopment without extraction. If it is not possible to place the lower anterior teeth over the ridges in an upright position, then the extraction of four premolars is recommended.

In the third case, which must represent nearly all malocclusions, the only possible correction according to Tweed is the extraction of four premolar teeth, because if the under-

developed alveolar arches are brought to normalcy, there will be a greater discrepancy between the alveolar and basal structures, and we shall produce a bimaxillary protrusion. Tweed is quite certain that the basal structures will never develop.

The fourth case represents the true bimaxillary protrusion which is very rarely met with in practice. Case reported one such case which he treated by the extraction of all teeth and used artificial dentures.

Dr. Riesner states that the teeth are forward on their basal bones on account of forward translation. If that is the case, the alveolar arches must be overdeveloped in relation to the basal bones. While this is not admitted, Dr. Riesner subscribes to a treatment which consists of reducing the size of the alveolar arches to better harmonize with the basal structures. If the alveolar arches are not overdeveloped, why must they be reduced in size? And if they are normal, then the reduction of the alveolar arches must result in the impairment of those beautiful facial lines which Tweed hopes to develop. There seems to be an inconsistency between the theory and practice, and the statement still holds that the acceptance of Tweed's teachings carries with itself the assumption that malocclusions are due to an overdevelopment of the alveolar arches. Unless that is the case, there can be no excuse for the extraction of four sound teeth.

The next question taken up by Dr. Riesner is the use of photographs of skulls of various races borrowed from N. G. Bennet. He states that the use of these plates is too uncertain a basis for conclusive proof. Besides it is observed that only the skull of the Englishman shows a malocclusion, the others being nearly normal; therefore, we cannot draw conclusions from them. But Dr. Riesner misunderstood the purpose for which these photographs were shown. They were included to demonstrate that the condition Tweed tries to establish is not found in the normal. The forward relationship of the teeth with respect to the basal bones is not uniform, and there is a great variation between the different races and different individuals of the same race.

Referring to the lingual extension of the alveolar process of the mandible in the posterior region, it is stated that, contrary to my conclusion, the "buccal or cheek teeth" are situated over the bony base in the axial direction of their stress. An examination of several mandibles will reverse that opinion.

Regarding the unsubstantiated statement that "if the anterior teeth are uprighed or brought back too far, it is one of the most harmful procedures," Dr. Riesner asks where has this been demonstrated. My answer to that is that I gave up the uprighing of anterior teeth some twenty years ago on account of frequent devitalizations and extensive root resorptions. I also found that the true uprighing of anterior teeth is not permanent, for we cannot maintain a tooth in an abnormal position, no matter how long retained. Furthermore, I wish to point out that my original statement was misunderstood, and that I have stated that when the uprighing to teeth is carried too far, it is dangerous. This does not mean that if the anterior teeth are brought back too far it is dangerous. There is a difference between carrying the uprighing too far or carrying the anterior teeth too far back; and one has nothing to do with the other.

In trying to dispute the statement that the apparent protrusion of the dental arches is transitional, Dr. Riesner asks "at what age can we expect to see a permanent mature form of dental arches, and are there any progressive records to show it?" We do not exactly know when that occurs but we know definitely that it does not occur at the age of 14 or 16 years. Full development cannot happen before the late twenties or early thirties. It is quite certain that growth changes continue far beyond the eruption of the second permanent molars, the limit accepted by Tweed. This was discussed in my paper in detail.

Then the following question is asked, which requires a definite answer. If the forward drift is a normal condition of developing pattern that realizes its definite form in maturity through function, should we defer and reserve orthodontic correction until adulthood? Inasmuch as the alveolar arches nearly reach their full development upon the eruption of the second permanent molars, the proper time to begin treatment is when all the deciduous teeth are shed and are replaced by their permanent successors. Treatment is more successful after that period than before it. In other words, it is better to start a case too late than too early, and never begin complete correction of a deciduous dentition. But the sooner the treatment

is begun after all the deciduous teeth are replaced, the better the chance that the basal structures catch up with alveolar development.

The uprighting of teeth is desirable whenever the anterior teeth cannot assume their normal axial positions on account of deleterious masticating stresses, such as in case of very deep overbites in Class II cases. But whenever there is a discrepancy in the growth of the basal structures and the alveolar arches so that there is an inclination of the anterior teeth with perfectly good occlusion, the uprighting is not desirable. Such movement requires the maintenance of the same occlusal relations with the bringing out of the apical area. That movement, when carried too far, is dangerous.

And now we come to a point where Dr. Riesner asks how it is that in not one single instance was a case of so-called bimaxillary protrusion of the young developmental arch reported that was spontaneously corrected through function. It is intimated that the "reason for this is obvious." Here, the implication is that not one single case can be shown to substantiate the arguments advanced in my paper. In answer to Dr. Riesner's inquiry, I wish to point out that a few cases could be found to demonstrate any condition, and I ask with all sincerity whether the presentation of a few cases would be convincing to prove the points brought out. I purposely refrained from showing cases, and also from presenting original data expressly compiled to prove any point. It must be more convincing when a controversial subject can be disproved by existing data not originally intended to prove the point under investigation.

It is further stated that Tweed's approach is not new, and that such men as Calvin Case, Cryer, and others approved of extraction. What Dr. Riesner fails to bring out is that there was a controversy over this subject between Angle and Case, and that Angle was able to convince the profession that extraction is not to be considered as part of orthodontic treatment.

In this rebuttal, I believe I have answered Dr. Riesner fully and fairly. I always welcome constructive criticism, and am eager to acknowledge errors which I may have made in my studies. I regret that I had to reject every point Dr. Riesner brought up in the criticism of my paper; and I am compelled to reaffirm my belief that after the wave of enthusiasm which followed the introduction of Dr. Tweed's methods dies down, there will be a return to a more normal and more conservative treatment of orthodontic cases.



## REASONABLE INTERPRETATION OF EARLY ORTHODONTIC TREATMENT

### A CASE REPORT

FRANK W. NASH, D.D.S., SCRANTON, PA.

The following is a case report of a white boy on whom treatment was begun at 8 years of age.

Using the Angle classification, this is a Class II, Division 1 case. The x-ray examination indicated that the permanent successors to the deciduous teeth were all present, and there was no evidence of pathology. (The statement, "using the Angle classification," is made to indicate a measure of qualification or reservation. The reason for this is that it is felt that, at the moment, there is quite a difference in opinion among legitimate orthodontists in regard to classification. This classification of Angle brings to mind a picture of tooth relationship without necessarily any connotation of what is wrong in any particular case. It is used in the sense that it relates to local occlusal tooth relationships and not to their relationship to the skull. We all know that there is a great variation in cases that, from an occlusal-tooth-relationship point of view, may appear similar.)

As an infant, this patient was bottle-fed. According to the account of the parents, subsequent diet was of good character with little in the way of sweets. This was substantiated by the lack of caries in the teeth as well as the very good condition of the gum tissues. He had mumps at 7 years of age; measles, at 7½ years of age; and up to the time of coming for treatment had had continuous colds during the winter months. Tonsil and adenoid operations were performed at 4 years of age and again just before he came for orthodontic treatment. No teeth had been lost prematurely. There were no accidents so far as the jaws were concerned. The only accident in the history of the patient was a broken wrist, which happened at about 7½ years of age. His apparent state of health at the time of applying for treatment was good. His mental development was good. As for his physical development, he was not underweight and was of average height. His general posture was good. His mouth posture was regarded as very poor. The lower lip was being sucked upon continuously and was appreciably enlarged thereby. There was no history of endocrine disturbance. From a hereditary standpoint, he was born to parents of mature years, both of whom, however, carried a history of good health.

It is believed that the primary susceptibility to deformity was in the deficiency of tone in the oral structures, probably resulting from bottle feeding. The fact that colds had existed continuously every winter constituted a serious interference in the breathing function. While the colds disappeared to a large extent during the summer months, the deformity of the denture resulting from the forced mouth breathing offered an opportunity for the development of the lip-sucking habit, which very likely enhanced the arch malformation.

Read before the New York Society of Orthodontists, Nov. 9, 1943.

Fig. 1.



Fig. 2.



Figs. 1 and 2.—Side views of casts prior to treatment.

Fig. 3.



Fig. 4.

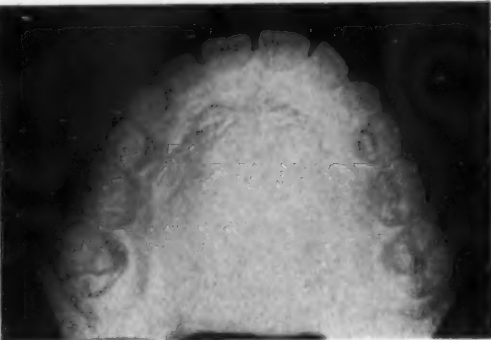


Figs. 3 and 4.—Side views of casts at end of treatment described in report.

Fig. 5.



Fig. 6.



Figs. 5 and 6.—Occlusal views of upper casts prior to and after treatment.

Fig. 7.

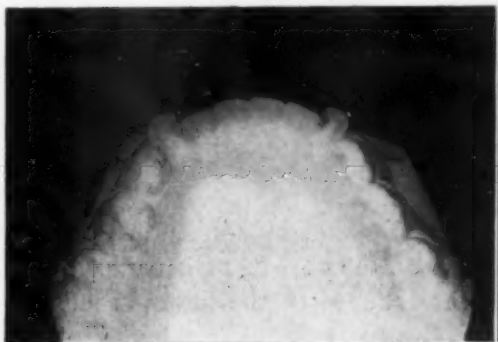


Fig. 8.



Figs. 7 and 8.—Occlusal views of lower cast prior to and after treatment.

The general plan of treatment with appliance therapy was to make the arches harmonious in form and move the upper arch distally, bringing about a proper relationship with the lower. It was explained to the parents that at the end of this phase of treatment all of the permanent teeth would not have developed. The idea of treating the case at this age was to provide a functioning denture as early as possible, because if this denture functioned along

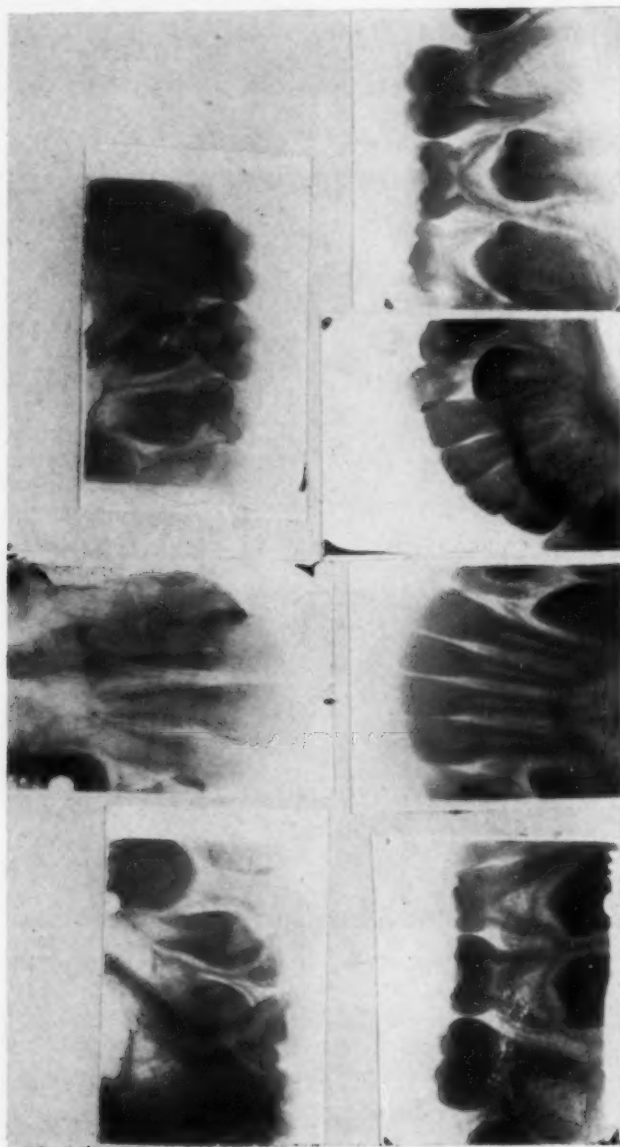


Fig. 9.—Radiographs of teeth prior to treatment.

normal or nearly normal lines, the rest of the denture would have a better chance to develop normally and the individual would be able to use teeth in chewing, as they were meant to be used, with the consequent benefits to him. There was to be no attempt to make great changes in the lower arch. The reason for this attitude was that it was desirable to avoid pushing the lower anterior teeth off the ridge. Appliances of the Atkinson type were used, band-

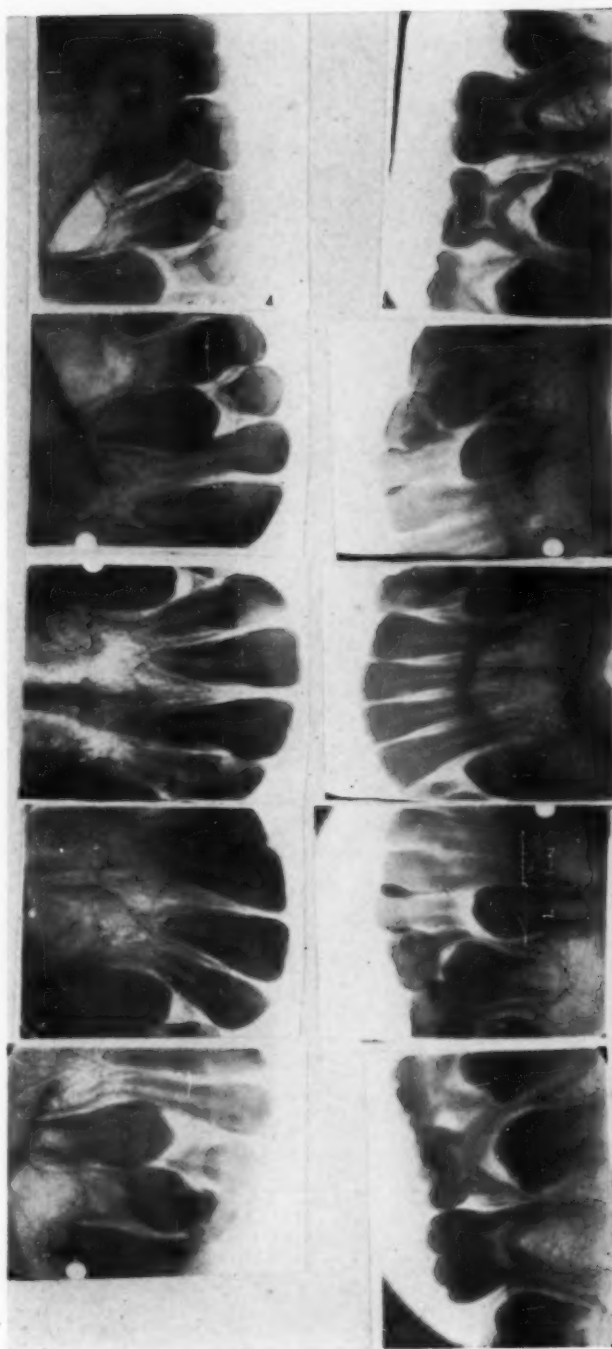


Fig. 10.—Radiographs of teeth at end of present stage of treatment.



ing the upper first permanent molars, upper anteriors, and lower first molars. A sliding wire, attached to a labial wire on the upper, was arranged for the use of intermaxillary elastics. This sliding wire operated largely against the upper first molars, moving them distally. This movement was accomplished between September 19 and December 21. At that time, the tonic lip exercise,

Fig. 11.

Fig. 12.



Fig. 13.

Fig. 14.

Figs. 11, 12, 13, and 14.—Radiographs of upper and lower cuspid areas at conclusion of treatment, indicating opportunity for normal eruption of cuspids.

as formulated by Dr. Rogers, was started. The exercise was to be carried on thirty minutes a day. Appliances were kept on for some time, and the elastics were worn at night. A finger-sucking habit had been started in the meantime. It was felt that the wearing of elastics at night would assist in bringing about normal muscular posture and combat much of the bad effect of the finger-sucking habit.

Appointments during treatment were approximately three weeks apart. The response to appliance therapy was very good. The only complication was the finger-sucking habit, which compelled the keeping on of appliances somewhat longer than otherwise would have been the case. The case was not carried to a fully normal relationship because it was felt that, with the establishment of normal breathing and normal mouth posture, nature could better evolve the finishing touches. It is not known that the case will continue on to

Fig. 15.



Fig. 16.



Fig. 17.



Figs. 15, 16, and 17.—Intraoral views of case; anterior right and left sides at conclusion of treatment.

Fig. 18.



Fig. 19.



Fig. 20.



Fig. 18.—Photograph of patient prior to treatment.  
Figs. 19 and 20.—Photographs of patient at end of this period of treatment.

normal development of all the teeth, but it does have a far better chance of that in its present state, than if it had been allowed to remain as it was at the time of presentation for treatment.

No appliances are being placed for retention. A latex appliance, however, has been worn at night. This is to assist in promoting normal breathing and normal lip posture; in short, normal muscular habits, generally.

The tonic lip exercise is to be continued. The finger-sucking habit has stopped.

The results achieved so far are: a definite improvement in function and a definite improvement in facial appearance. The patient has grown about 2 inches and weighs 85 pounds, a gain of about  $3\frac{1}{2}$  pounds since treatment was started. He has become very happy over the improved appearance and better functioning of his mouth.



Fig. 21.—Intraoral view at end of treatment. The lower deciduous cuspids are unsightly from this angle, but they function. It would be incorrect treatment to align these teeth at this stage. The only alternative is to extract the deciduous cuspids and use an appliance as described by Hays Nance. This, however, would satisfy only esthetics and would not enhance the possibilities for normal development. See radiographs of these areas.

In this case, a fully normal relationship for the present stage of dental development has not been produced in the region of the anterior teeth. One of the reasons for not establishing this normal relationship is the position of the lower teeth on the ridge. If complete correction of the anterior teeth relationship were carried on by appliance therapy at this stage, it is believed that mistreatment would occur rather than anything else. There is a definite difference at present between tooth development and bony development. The tooth development is in advance of the bony development and it is not desirable to try and change it at this stage. The adjustment that is needed now is a very delicate one. The lower deciduous cuspids are arranged on the labial side of the lower anteriors. They are generally found on the lingual, with the lower anteriors fanning out labially to them. From the standpoint of their use in providing some function and maintaining lower arch length, however, they are virtually as satisfactory as though they were lingual to the incisors. It is not deemed necessary to use the treatment suggested by Hays Nance, in which, after extraction of lower deciduous cuspids, this lower arch length is maintained by the use of a lingual arch.\*

\*This method was shown by Dr. Nance in a table clinic at the meeting of the American Association of Orthodontists in Los Angeles, July 11 to 14, 1938.



With the continued improvement of mouth posture and the functioning of normal breathing habits and normal swallowing habits, nature will have an opportunity to mold this denture along the proper lines. The so-called result at this stage is definitely unorthodox. It appears wise, however, to stop fixed appliance therapy at this stage.

In so far as treatment through appliances has gone on, the Atkinson type of appliances was used. It is believed that the upper arch was moved distally, to some extent. It is also believed that treatment of the case, so far, could have been accomplished with other appliances than the Atkinson type. Substantially, treatment of this case from an appliance viewpoint has been easy or simple up to this stage.

One of the principal reasons for its presentation as a case report is that it represents a reasonable interpretation of early treatment; it provides an opportunity to stress the part that natural forces play in the development of a normal denture. The longer muscular forces develop along abnormal lines, the more difficult they are, in my experience, to train along normal lines. Most orthodontists probably agree about this. The earlier we can aid the patient in securing a functioning denture, the better it is from the standpoint of the correct development of the denture, and from the standpoint of the whole development of the individual. This comment is stressed because, while many cases are being treated reasonably and intelligently at an early age, there is also a tendency developing for postponing treatment, until about 12 years of age, because of bimaxillary protrusion. It is not a certainty that the diagnosis of bimaxillary protrusion is always correct.

The case as presented indicates a very great reliance on nature on the part of the orthodontist. However, it is an interpretation of the principles of corrective therapeutics in orthodontics as proposed by Dr. Alfred Paul Rogers.

## Editorial

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### American Association of Orthodontists in Chicago

In this issue of the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY, there appears the program for the meeting of the American Association of Orthodontists, which is to be held at the Edgewater Beach Hotel, Chicago, Illinois, April 25 to 27.

While the program is not entirely complete at the time of going to press, a quick appraisal reveals that the officers and the committees have provided a complete and comprehensive program. When taking into consideration the difficulties involved during these times of dislocation, this is, indeed, quite an accomplishment.

One of the features of the meeting that has been arranged is a panel discussion, to take place on Wednesday morning, at 9 o'clock. The subject is one of the highly controversial subjects of the day, "The Place of Extraction in Orthodontic Procedure." The moderator for this discussion will be Dr. George W. Hahn of Berkeley, California. The discussors will be: Charles W. Tweed of Tucson, Arizona, George W. Grieve of Toronto, Canada, Allan G. Brodie of Chicago, Illinois, and Milo Hellman of New York, N. Y. Subsequent to the formal discussion, time will be available for questions from the floor pertaining to the subject. This panel, obviously arranged on the plan of one of the current radio programs, should prove highly interesting and instructive and should serve as a means of helping to clarify much of the misunderstanding and controversy pertaining to the subject. Orthodontists cannot afford to miss this up-to-date program. Go to Chicago to the meeting and show your appreciation and loyalty to President Burrill and the group who have the courage and energy to put this meeting over during these times of dislocation! You can help with your presence.



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Max E. Ernst, Secretary, American Association of Orthodontists, 1250 Lowry Medical Arts Bldg., St. Paul, Minn.



## Department of Orthodontic Abstracts and Reviews

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Edited by

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**Extraction in Orthodontic Cases:** By P. M. Dunn, D.D.S., Minneapolis, Minn., *Minneapolis Dist. D. J.* 27: 135-137, June, 1943.

In the field of orthodontics, extraction is viewed by some men almost as a violation of professional procedure, while it is regarded by others as a quick and easy solution to certain types of orthodontic problems. The truth, as usual, is to be found somewhere between these two extreme points of view. Always bearing in mind the fact that the aim of all orthodontic treatment is to obtain satisfactory functional occlusion, we must admit that cases of severe crowding are sometimes encountered which cannot be satisfactorily treated except by extraction. As pointed out by Kelsey, twenty-eight teeth in good alignment and normal occlusion constitute a much more effective masticating organ than do thirty-two teeth overlapped and crowded with probably four or more of them out of function.

The molar teeth have not become reduced in size to accommodate themselves to the phylogenetic shortening of the jaws which has taken place in the course of human development. Thus we may have disproportionately large teeth in a small jaw, and, as a result, impaction of the third molars is often inevitable. When malocclusion is evidently due to abnormal position of the third molars, extraction of these teeth may well be indicated. Indeed, if the adolescent patient's radiographs indicate that the third molars are impacted in a position that is likely to cause pressure and crowding of the anterior teeth, the third molars should be removed.

Occasionally it may be advisable to remove other teeth. One or more premolars are sometimes extracted to provide more space for crowded anterior teeth, but every case in which removal of premolars seems to be indicated should be carefully studied for possible alternative treatment.

Schwartz states that even first molars should sometimes be removed to aid certain cases of distocclusion, but a contrary opinion is expressed by Salzmänn, who reviews Schwartz's findings. In my own practice I have never encountered a case in which removal of first molars was necessary for orthodontic reasons. The first molars are too important to be sacrificed if anything else can be done to correct the existing situation; and, in my experience, it has always been possible to do something other than extract the first molars.

The opinions of leaders in the field of orthodontics give us no general principle on which we can base a decision as to the merits of extraction as an aid

to orthodontic procedure. It is impossible to lay down general laws, because in every orthodontic case we are dealing with a biologic and not a mathematical entity. Hence, every case involves an individual decision.

The question is often asked: If we resort to extraction, should we then wait for nature to adjust the occlusion through subsequent drifting of the teeth, or should extraction be followed by the use of orthodontic appliances? I should be inclined to say that extraction, if it is used, should always be used to aid orthodontic treatment, not to eliminate or shorten it. Treatment may begin with extraction, but it should not end there. This principle may be difficult to explain to some patients, who are likely to become restless about the length of time required for successful orthodontic treatment, but for the patient's own good we must make the attempt. Also, we must condemn the practice of resorting to extraction merely because a patient does not have the means of paying for a long period of orthodontic treatment. We are under obligation to carry each case to a successful conclusion if that is humanly possible. We may aid nature in restoring functional occlusion, but it is asking too much if we merely extract a tooth and then wait for nature to do all the work of readjustment alone. Our aim should be to work with nature, remembering that complete self-correction, if it ever does occur, is an extremely rare event. Our procedure should always be, first to study the individual case as carefully and completely as possible, then to start the treatment indicated, and to wait and see what the results are before making any drastic changes in our method.

**Root Resorptions. Case Reports:** By Max W. Goldberg, D.D.S., Minneapolis, Minn., *Minneap. Dist. D. J.* 27: 138-140, June, 1943.

Root resorptions are often blamed on orthodontic therapy; therefore, the following cases of three sisters are interesting because there was no orthodontic treatment involved.

The percentage of incidence of resorption following orthodontic therapy varies according to the investigator, from 21 per cent (Ketcham) to 74 per cent (Rudolph). Hemley, in his work at New York University, found that, in a number of teeth treated by orthodontics 3.5 per cent showed evidence of root resorption, and of this group, only 0.2 per cent involved as much as one-third of the root. Grey states that, in his examination of students at Carleton College, all cases of resorptions had previously received orthodontic treatment.

The etiology of this condition is not known. Marshall, as a result of a series of experiments on monkeys, states, "Resorptions of bone or of tooth substance occur more readily when the animals are on deficient diets or are suffering from some metabolic or infectious disease."

Miller believes that it is due to a parathyroid disturbance.

Becks states, "Root resorptions observed in orthodontic practice are not produced by mechanical force alone, but they are rather the result of an individual predisposition to increased resorptive activity, due to various endogenous factors." Most of his cases had hypothyroidism.

**Dental History.**—The dental histories of these three sisters are practically the same. There has been marked caries of both the deciduous and permanent teeth since three years of age. Their occlusions are normal.

*Present Dental Roentgenographic Findings.—*

CASE 1.—Aged 14 years. Marked caries throughout the mouth and root end resorptions on

7	6	5	4	2	4	5	6	7
7	6	5	4	1	5	6	7	

There also seems to be a change in the pulp cavities.

CASE 2.—Aged 11 years. Marked caries throughout the mouth and root end resorptions on

5	4	1	1	4	5
6	5	4		4	5

There is also a change in the shape of the pulp cavities.

CASE 3.—Aged 9 years. Caries in the permanent molars. No apparent root end resorptions. Physical report by pediatrician.

CASE 1.—Physical examination essentially negative from a pediatric standpoint. Height, 5 feet, 6½ inches. Weight, 127 pounds. Wassermann reaction negative. Blood calcium, 9.63. Blood, 70 per cent hemoglobin with 9,000 leucocytes, and a normal differential. Urine, negative. Basal metabolic rate, 16 per cent; however, there is no clinical evidence of hypothyroidism.

CASE 2.—Physical examination essentially negative. Height 5 feet, 5 inches. Weight, 110 pounds. Blood calcium, 10.14. Blood, 72 per cent hemoglobin with 7,600 leucocytes, and a normal differential. Urine, negative. Basal metabolic rate, 6 per cent, which is normal.

Both of these girls had been consuming more than an average amount of milk.

*Conclusions.*—Root resorptions can occur with no apparent causes, and are most likely the result of metabolic disturbances, especially occurring at the time of puberty. These cases make one agree with Becks when he states, "Root resorptions observed in orthodontic practice are not produced by mechanical force alone, but they are rather the result of an individual predisposition to increased resorptive activity, due to various endogenous factors."

## News and Notes

### PROGRAM FOR THE MEETING OF THE AMERICAN ASSOCIATION OF ORTHODONTISTS AT CHICAGO, ILL.

APRIL 25 TO 27, 1944

#### TUESDAY

- 9:00- 1. Table Clinics.  
12:00 2. Meeting of the Research Section.
- Because of the limitation imposed by a shortened meeting and also because of the possible lack of appeal to the general membership, the Research Section has been arranged to run simultaneously with the general clinics. Its purpose is to allow those men who are actively engaged in orthodontic research an opportunity to discuss their problems with others of like interests. Abstracts of all reports will be published. All members of the Association are welcome to attend.
3. Commercial Exhibits.
- 12:15 Luncheon.  
2:00 Executive Session.
- Meeting called to order by President J. A. Burrill, Chicago, Ill. The National Anthem.
- Invocation, the Rev. Benjamin M. Will, D.D., Pastor, The Country Church of the City.
- 2:30 Address of Welcome, Irving S. Cutter, M.D., of Northwestern University Medical School, Medical Director of Passavant Memorial Hospital.  
Response, President-Elect Archie B. Brusse, Denver, Colo.
- 3:00 President's Address, J. A. Burrill, Chicago, Ill.
- 3:30 Paper, "Changing the Occlusal Level and a New Method of Retention," Alexander Sved, New York, N. Y.
- Synopsis:* The treatment of a large percentage of orthodontic cases cannot be completed until the vertical relationship of the teeth is properly adjusted. Usually, this involves the depression of the maxillary and mandibular anterior teeth and the elevation of the posteriors. This can be very quickly accomplished by means of a new appliance, which is also very efficient as a retainer. Rotated teeth can be properly held without the use of bands.
- 4:00 Report of the First Inter-American Orthodontic Congress by the President, Lieut. Col. Claude R. Wood.
- 8:00 Edward H. Angle Memorial Lecture: "Canine and Human Genetics: A Contribution to Orthodontia at Work," Wilton Marion Krogman, Ph.D., Assoc. Prof. of Anatomy and Physical Anthropology, University of Chicago.
- This lecture is a contribution to the Program by the Central Section.

#### TABLE CLINICS

1. Treatment and Retention of Unilateral Distocclusion Cases, Dr. W. K. Slater, Knoxville, Tenn.
2. Treatment of Bimaxillary Protrusions, Dr. Samuel J. Lewis, Detroit, Mich.
3. Principles of Orthodontics in Orofacial Prosthesis and Oral Surgery, Dr. Jacob C. Lifton, New York, N. Y.
4. A Modified Use of the McCoy Open Tube Band Lock to Utilize the Finer Gauge Arch Wires, Dr. L. H. Wirt, South Bend, Ind.
5. Functional Occlusion as an Aid to Comfort and Stability, Dr. A. L. Fern, Hartford, Conn.



6. The Use of a Cotter Key in Wiring Mandibular Fractures Allowing Quick Release in Case of Nausea and Vomiting, Dr. Hamilton D. Harper, Shreveport, La.
7. Intra-Oral Photography, Dr. Will G. Sheffer, San Jose, Calif.
8. Spot Welding Jig for Universal Bracket Assemblage, Dr. M. Alden Weingart, New York, N. Y.
9. A Hereditary Trait Indicating Maxillo-Facial Surgery in Father and Son, Dr. H. L. Shehan, Jackson, Mich.
10. A Classification of Malocclusions Which Offers a Definite Plan for Treatment, Illustrated by Means of Diagnostic Charts, Dr. Egon Neustadt, New York, N. Y.
11. Some New, Very Simple, Very Efficient Additions to the Labio-Lingual Technic, Dr. Russell E. Irish, Pittsburgh, Pa.
12. Cephalometric Diagnosis of Abnormal Position of Mandible, Dr. John R. Thompson, Chicago, Ill.
13. Novelty Clinic, Dr. S. D. Terrell, Fort Worth, Tex.
14. Efficient and Durable Appliances Constructed of Chrome Alloy, Dr. Charles J. Vosmik, Cleveland, Ohio.
15. Twenty-Five Orthodontic Cases Before and After Treatment, Dr. Russell Hering, Milwaukee, Wis.
16. Little Things That Are a Big Help, Dr. E. W. Anderson, Cedar Rapids, Iowa.
17. A Report of Two Cases Complicated by Extraction of First Mandibular Molars, Dr. Henry Spenadel, New York, N. Y.
18. Extraction in Orthodontic Treatment, Dr. George W. Grieve, Toronto, Can.
19. Simplified Steps in Chrome Alloy Technique, Dr. Philip Dorenbaum, Providence, R. I.
20. McCoy Appliances, Dr. Louis S. Winston, Houston, Texas.
21. Indications for Early Orthodontic Treatment, Dr. C. E. Burroughs, Summit, N. J.
22. Case Reports and Treatment Procedure on Bimaxillary Protrusion—Using the Edgewise Mechanism, Dr. A. P. Westfall, Houston, Tex.
23. Occipital Anchorage, Dr. H. E. Jerrold, Brooklyn, N. Y.
24. Orthodontic Problems, Dr. W. R. Alstadt, Little Rock, Ark.
25. Refinements in Orthodontic Technique, Dr. John Sage, Flushing, N. Y.
26. The Construction and Use of an Integrated Chrome Alloy Attachment, Dr. S. T. Holmes, Muskegon, Mich.
27. The Distal Movement of an Impacted Upper Third Molar to Save the Second Molar, Dr. R. W. Eaton, Rochester, N. Y.
28. A Modern Philosophy of Orthodontic Treatment, Dr. L. Braun, Detroit, Mich.
29. Differential Tissue Changes During Continuous and Intermittent Tooth Movement, Dr. Stephen G. Lee, East Orange, N. J.
30. Original Design of Bracket for Model Grinder, Dr. W. H. Grinnell, Boston, Mass.
31. Some of Hellman's Records Illustrating Fundamentals in Orthodontics, Dr. M. A. Munblatt, New York, N. Y.
32. Variation in Design and Hook-Up of the Ernest L. Johnson Occipital Anchorage, Dr. C. W. Konigsberg, San Francisco, Calif.
33. Diagnosis of Bimaxillary Protrusions and Their Comparison With Casts of Normal Non-Orthodontically Treated Dentitions, Dr. V. R. VerMeulen, Grand Rapids, Mich.
34. (a) Combination Retainer and Bite Plane; (b) New Method for Moving Impacted Cuspids Into Alignment, Dr. R. E. Allen, Jacksonville, Fla.
35. X-rays Showing Orthodontic Treatment of Impactions, Dr. Lester H. Tate, Canton, Ohio.
36. Occipital Anchorage, Dr. D. C. Miller, Columbus, Ohio.
37. Preliminary Report on Method of Bite Raising of Two Opposing Teeth on Each Side Accompanied by Radiograms Showing Absence of Trauma, Dr. Homer B. Robison, Hutchinson, Kan.

38. Chart—Showing Some Deviations From Orbital and Eye-Ear Plane, Dr. Noble A. Powell, Ventura, Calif.
39. Some of the Problems in Orthodontics—Kodachrome Slides, Dr. George Nagamoto, Amache, Colo.
40. Fifty Consecutively Treated Cases and Also Patients Showing Use of Kesling Tooth Positioning Appliance, Dr. Howard E. Strange, Chicago, Ill.
41. A New Type of Bite Plate and Retainer, Alexander Sved, New York, N. Y.
42. One Colloid Impression for Three Uses: (1) Making Record Casts, (2) Pouring Dies for Indirect Band Technique, (3) Pouring Dies With Stone Cast in Indirect Appliance Construction, Lowrie J. Porter, New York, N. Y.
43. Records of Non-Extraction and Extraction Cases Treated With the Edgewise Mechanism, E. A. Bishop, Seattle, Milton Fisher, Olympia, E. J. Fraser, Paul D. Lewis, Seattle, and Wm. McGovern, Aberdeen, Wash.

#### RESEARCH SECTION

1. Fetal Jaws—Jaw Form, Tooth Development and Position. An exhibit of twenty-five translites. Departments of Orthodontics and Oral Pathology, Baltimore, College of Dental Surgery, Dental School, University of Maryland, George M. Anderson and M. S. Aisenberg, Directors.
2. Orthodontic Elastic Ligatures: A Quantitative Study of Force Control and Conditions of Storage, Fred F. Crutcher, senior student, and Wendell L. Wylie, D.D.S., M.S., Department of Orthodontics, University of California.
3. A Statistical Analysis of the Constancy of Certain Facial Dimensions, Wendell L. Wylie, D.D.S., M.S., Department of Orthodontics, University of California.
4. Experimental Depression of Teeth, William Lefkowitz, D.D.S., and Leuman M. Waugh, D.D.S., Department of Orthodontics, Columbia University.
5. Formation of Cementum, William Lefkowitz, D.D.S., Department of Orthodontics, Columbia University.
6. X-raying Plaster Models: A Method of Studying the Relation of Tooth Mass to Supporting Bone, William B. Downs, D.D.S., M.S., Department of Orthodontia, University of Illinois.
7. Diagnosis of Normal and Abnormal Position of the Mandible by Cephalometric Roentgenography, John R. Thompson, D.D.S., M.S.D., M.S., Department of Orthodontia, University of Illinois.
8. Can Mandibular Teeth Be Moved Distally by Means of Second Order Bends, Head-cap and Elastics? A. Goldstein, D.D.S., M.S., and E. Myer, D.D.S., M.S., Department of Orthodontia, University of Illinois.
9. Experimental and Clinical Studies in Cranial Development, Maury Massler, D.D.S., M.S., Child Research Clinic, University of Illinois.
10. Variation of Mandibular Incisor Axis in Adult "Normal" Occlusion, Thomas D. Speidel, D.D.S., M.S., and Morris M. Stoner, D.D.S., Department of Orthodontia, Indiana University.
11. Congenital Absence of Teeth, Byron O. Hughes, Ph.D., Schools of Dentistry and of Education, University of Michigan.
12. Growth Changes of Maxillary and Mandibular Dental Arches, Gerald V. Barrow, D.D.S., M.S., Department of Orthodontics, University of Michigan.
13. Inheritance of Tooth Size in Man: Analysis of Variance, Laehlan W. Noble, A.B., D.D.S., M.S., Lt. (jg), U.S.N., and Robert W. Clements, A.B., D.D.S., M.S., Department of Orthodontics, University of Michigan.
14. A Dento-Facial Study of Male Students in the Physical Hardening Program of the University of Michigan, James W. Reynolds, B.S., D.D.S., M.S., 1st Lt. D.C., U.S.A., and Russell E. Huber, B.S., D.D.S., M.S., School of Dentistry, University of Michigan.
15. The Application of Dynamic Symmetry to a Study of Skeletal Pattern of the Face, Harland New, D.D.S., Department of Orthodontics, Northwestern University.

16. Three-Dimensional Measurement of Facial Skeletal Points in the Living, Using Broadbent-Bolton Cephalometer, Harold Schwartz, B.S., D.D.S., M.S., Department of Orthodontics, Northwestern University.
17. A Study of Changes in Dental Arch Width of Patients in Retention, Earl Christie, D.D.S., Department of Orthodontics, Northwestern University.
18. A Study of Embouchure Adaptation as a Function of the Dento-Facial Complex, Edward A. Cheney, D.D.S., Department of Orthodontics, University of Michigan.
19. A Classification of Dental Arches According to Variations of Their Anterior-Posterior Length, Egon Neustadt, M.U.D., F.I.C.D., New York, N. Y.

## WEDNESDAY

9:00- "The Place of Extraction in Orthodontic Procedure."

12:00 This will be a panel type of presentation with George W. Hahn of Berkeley acting as moderator. Those participating in the discussion will be Allan G. Brodie of Chicago, George W. Grieve of Toronto, Milo Hellman of New York, and Charles Tweed of Tucson.

This discussion is designed to be informative rather than controversial in nature, and one in which it is planned to show the place that the extraction of teeth has in orthodontic therapy, with the reasons for and against such procedure.

The subject matter of the discussion will be presented in the following order:

"Orthodontia, Its Objectives, Past and Present," George W. Hahn.

"Indications for the Extraction of Teeth in Orthodontic Procedure," Charles Tweed.

"Fundamental Principles vs. Expedient Compromises in Orthodontic Procedure," Milo Hellman.

"Anatomical and Clinical Problems Involved Where the Extraction of Teeth Is Indicated," George W. Grieve.

"Does Scientific Investigation Support the Extraction of Teeth in Orthodontic Therapy?" Allan G. Brodie.

The men invited to participate in the discussion have been chosen because each is a recognized authority in his respective field and each is intensely interested in the progress of orthodontics. Their scientific contributions have been supplemented by years of clinical experience and teaching.

Following the papers there will be an informal discussion between members of the panel, with sufficient time reserved for questions from the membership at large.

12:15 Past-President's Luncheon.

2:00 Reading of Prize Essay:

The Board of Governors, at the meeting of the Association held in New Orleans, established an award of \$200 and empowered the Research Committee to conduct an annual Prize Essay Contest. The terms of the competition were set as follows:

Eligibility: Any student enrolled in a recognized university, or any person who had completed his or her formal education in orthodontics not more than two years prior to January 1, 1943, would be eligible to compete for the prize.

Essay: The essay must represent a piece of original research having a direct bearing on the field of orthodontics. It may relate either to a biological or clinical problem and may represent material that has been offered in partial fulfillment of the requirements of a graduate or post-graduate degree, or any graduate, post-graduate or undergraduate contest.

(Note. Owing to the postponement of the regular 1943 meeting, the above rules were modified for the present contest only. The deadline was extended to Feb. 1, 1944, and the two-year provision was made three years in order to protect those contestants who had previously submitted manuscripts.)

3:00 Paper, "Heredity and Variation in the Dentofacial Complex," Byron O. Hughes, Ph.D., Ann Arbor, Mich.

*Synopsis:* Investigation of several attributes of the dentofacial complex has revealed the extensive operation of hereditary factors which contribute to the formation of normal and malocclusion. These findings have been useful in ascertaining etiological bases, in outlining treatment procedures, and in estimat-

ing probable prognoses of clinical cases. Further work has shown development or growth to be an unfolding design of inter-related morphological and functional items. The developmental plan is supplied by genetic facts in which the material and technique of application is provided by nurture and environment. Each of these two areas, nature and nurture, contribute similarities and differences, usually termed the phenomenon of variability, within and between individuals. The genetic variability is fixed at conception; the nurtural variability is subsequently applied. The genetic contribution to variability not only is precedent in time, but also appears to exercise marked control over any nurtural and/or environmental circumstances which are instituted to modify the individual. The problems in the application of nurtural factors appear to lie largely in the production or stimulation of favorable variation and in the avoidance of unfavorable change. Treatment procedures, then, should recognize and utilize the assets and liabilities provided by hereditary variation and should not be applied independently and without regard to the familial design toward which the organism is going. A knowledge of the individual design permits nature and the orthodontist to work together toward correction. In practice the data argue for the longitudinal study of each case to determine his natural direction and the study of all available parental and sibling data to determine his past and future status.

- 3:30 Paper, "Heredity as a Guide in Dentofacial Orthopedics," George R. Moore, Ann Arbor, Mich.

*Synopsis:* Genetic phenomena appear to be responsible for the amount of alveolar bone to be provided in the given case and the rate, through growth, at which it will be provided. Whether we can stimulate a greater amount to be grown than this remains to be demonstrated. We think, probably not! We pose then the proposition that effective orthodontic work of all kinds may be done within the limits set by the amount of alveolar bone, and an appraisal of the amount available at a given time can be made by direct examination, and a conservatively accurate estimate of the amount yet to be obtained through growth can be ascertained by recourse to hereditary evidence. In this paper, case reports will be presented in which information concerning heredity is used as a basis for treatment.

- 4:00 Executive Session.  
6:00 President's Reception.  
7:00 President's Ball.

## THURSDAY

- 9:00 Paper, "The Forsyth Orthodontic Survey of Untreated Cases," Edward I. Silver, Boston, Mass.

*Synopsis:* This paper represents a survey of untreated cases at the Forsyth Dental Infirmary, Boston, covering a period of more than ten years. About 400 cases were observed, starting at about age three or four, and studied at regular intervals to determine the changes which have taken place in the growth and development of the teeth and jaws without orthodontic aid.

- 10:00 Paper, "Phases of Maxillo-Facial Surgery of Interest to the Orthodontist," Frederick W. Merrifield, D.D.S., M.D., F.A.C.S., Chicago, Ill.

*Synopsis:* The orthodontist has a right to congratulate himself on the amazing results which have been accomplished in the modern scientific approach to his specialty. Most of his work is done without benefit of any aids but that of his own judgment, intuition and mechanical skill. More recently it has seemed that a knowledge of the basic sciences, particularly anatomy, physiology and histology, was desirable. Then, too, the field has been made broader and more inclusive by studies of growth and development and nutrition. Finally, the oral surgeon has been able to add a little to this new curriculum and to offer surgical solutions to some of the problems which, while they may make for more exasperating and argument-provoking situations, provide that spice and challenge



which we prefer to accept rather than that of an easy rule of thumb method. We mention dentigerous cysts, unerupted cuspids, jaw fractures, jaw resections, abnormal lip function, the third molars, facial paralysis, and the results of amateur orthodontic efforts.

11:00 Ketcham Award by the American Board of Orthodontists.

First Dewey Award given to clinician for most outstanding Clinic.

12:15 Luncheon.

1:30 Limited Attendance Clinics:

Use of the Plaster Model in Case Analysis and Treatment Planning, William B. Downs, Chairman, assisted by B. L. Herzberg and J. R. Thompson.

*Résumé:* The plaster model represents the area in which the orthodontist uses mechanical therapy in the treatment of malocclusion. It serves to show detail relationships of the teeth, but what is more important, it can be a great aid in evaluating the relationships of the component areas of the face. The clinic will illustrate some ways in which orthodontic models may be used in laying out a treatment plan.

Orthodontic Treatment Employing Chrome-Alloy Metals, William R. Humphrey, Chairman, assisted by W. B. Stevenson, F. Copeland Shelden, George H. Siersma, and Ralph Waldron.

*Résumé:* In this clinic different techniques will be demonstrated by the men listed above which show the development of treatment methods using chrome-alloy metals. The cases treated by the different techniques will demonstrate the efficiency of appliances made of chrome alloy as well as the tolerance which the hard and soft tissues of the oral cavity exhibit toward these metals.

The following techniques will be shown:

Stevenson: The labio-lingual arch technique.

Shelden: The edgewise appliance.

Waldron: The universal appliance and the twin-arch technique.

Siersma: Full-banded technique using small-gauge round labial wires in brackets.

The Use of the Twin-Wire Mechanism in the Treatment of Compromised Cases, Joseph E. Johnson, Chairman.

*Résumé:* A series of Kodochrome slides taken at regular intervals will be presented showing the technique of treating these cases.

Final Positioning of the Teeth to a Predetermined Pattern and Retention, H. D. Kesling, Chairman, assisted by Robert A. Rocke.

*Résumé:* Models to show different steps of technique to set up the plaster teeth to a predetermined pattern. Models of practical treated cases showing results of the Tooth Positioning Appliance.

Fundamentals of the Edgewise Arch Mechanism, Chester F. Wright, Chairman, assisted by Abraham Goldstein, Silas J. Kloehn, Ernest Myer, and Arthur C. Rohde.

*Résumé:* This clinic will attempt to explain the underlying principles of the Edgewise Arch Mechanism and will attempt to show how the appliance is employed in the attainment of the objectives of orthodontic therapy. Following a brief introductory statement as to the usefulness of the appliance and the reasons for its introduction, demonstrations will be given on such problems as "bracket band formation and placement" as well as "the role played by the arch in treatment."

4:00 Executive Session.

### To the Members of the American Association of Orthodontists

In calling a meeting of the American Association of Orthodontists for April 25, 26, and 27, 1944, your officers and board recognize the fact that the war is still raging and transportation facilities still crowded, but they also recognize that too great an interval between meetings of our organization tends to break the continuity of orthodontic thought

and interest. New scientific thought, new methods of treatment, and new materials are being developed constantly. They must be brought before the profession to be discussed and digested before they can be passed on to the patient. That cannot adequately be done without our meeting in organized general sessions.

As for the continuing warfare, our country is sufficiently mobilized and armed now so there is little fear of the enemy attacking our shores. We are fortunate in being able to work, undisturbed by the blasts of cannon and bombs. The drone of the airplanes in our skies brings us assurance, instead of dread. Thanks to this assurance, we need not lag in our efforts to keep our rising generations healthy, strong, and happy, and free from facial and dental defects which we are equipped to correct. We are able to eliminate many of the factors that weaken morale and destroy the courage that our young patients need in order to face the future.

The railroads are now better organized to handle the necessary traffic in reasonable wartime comfort, and if those who will attend our meeting will plan and make reservations far enough in advance it will work no hardship on anyone.

We have a program prepared for you that will be worth considerable sacrifice in time and travel. The Research Committee has seventeen scientific essays entered in competition for the \$200.00 prize our organization has offered. The winning essay will be read before the general session. We have been offered more clinics than we can accommodate, and our program should merit your closest attention.

The Edgewater Beach Hotel, which has been our host on so many occasions, will welcome you with everything as of old, except for possible changes in the cost of food and refreshments.

Chicago will welcome you.

J. A. BURRILL, President.

### **Relocation of Physicians and Dentists for Civilian Practice in Cooperation With the U. S. Public Health Service**

By recent Act of Congress (Public Law 216, signed by the President, Dec. 23, 1943), \$200,000 was made available to the U. S. Public Health Service to assist in relocation of physicians and dentists. Major provisions of the Act are as follows:

1. A municipality, county, or other local governmental unit may apply to U. S. Public Health Service for relocation of a physician or dentist to an area within its jurisdiction.
2. The application must first be approved by the State Health Officer having jurisdiction over the local government.
3. The Surgeon General of the U. S. Public Health Service is then authorized to enter into an agreement with a physician or dentist to the effect that:
  - a. If he will agree to practice his profession in the critical locality for a period of not less than one year, he will be paid a relocation allowance of \$250 a month for the first three months.
  - b. He will also be paid the actual costs of travel and transportation to the new locality for himself, his family, and his household effects.
4. The local government making the application shall contribute 25 per cent of the total cost of the payments provided.
5. No contract will be made with any physician or dentist unless he is admitted to practice by the State having jurisdiction over the new location.

Since it is the duty of the State Chairmen, Procurement and Assignment Service, to determine which physicians and dentists are available for relocation, the U. S. Public Health Service has requested the assistance of Procurement and Assignment Service. The details and nature of Procurement and Assignment Service cooperation with the U. S. Public Health Service are now being worked out in conferences between the two agencies. In the meantime, the Public Health Service is writing to each State Health Officer regarding this new law and is suggesting that the State Health Officers work out with State Chairmen, Procurement and

Assignment Service, a list of critical areas, using as a basis the communities reported to the Central Office in the last monthly report. It is hoped that State Health Officers and State Chairmen may be able to evaluate the needs of areas applying to the Public Health Service for physicians or dentists. Assistance, however, may be obtained from the District Offices of the U. S. Public Health Service or from the Central Office, Procurement and Assignment Service.

In addition to the work State Chairmen have already done in determining which physicians or dentists are available for relocation, the Central Office will continue to see that you are furnished data concerning physicians discharged from the Army and Navy, interns and residents not qualified for military service, and available physicians or dentists licensed to practice in your State but who are now located in some other State. It is hoped that the majority of relocations may be effected within State boundaries. If, when this program is completely worked out, there should be difficulty in finding personnel available for relocation in your State, it may be possible to find persons licensed in other States who would be eligible to practice in your State through reciprocity provisions of licensure laws.

Directing Board, Procurement and Assignment Service,  
War Manpower Commission, Washington 25, D.C.

### Eligibility of Dentists for Passenger Car Tires

February 3, 1944.

To: Secretaries of State Dental Societies,  
Chairmen, State Military Affairs Committees,  
Editors

The War Service Committee transmits herewith Release of the Office of Price Administration, regarding the eligibility of dentists and others for passenger car tires. This information will obviously be of advantage to each individual dentist in his contacts with his local rationing board.

C. WILLARD CAMALIER, Chairman  
War Service Committee American Dental Association.

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"The purpose for which a person drives his automobile, rather than the distance he drives it in a given month, hereafter will determine his eligibility, under rationing, for passenger car tires," the Office of Price Administration said today.

"Serious depletion of the supply of used passenger tires available for rationing to low mileage drivers, coupled with inadequate stocks of new tires, compels a shift in the tire rationing program from a 'mileage' to an 'occupational' basis," OPA said.

Effective February 1, OPA is abandoning the existing regulation that only those persons holding gasoline rations good for driving 601 miles a month or more can qualify for Grade I tires—new prewar tires or new tires made of synthetic rubber. Thereafter, any person who drives his car in connection with a highly essential occupation, regardless of his gasoline ration, may apply for a ration certificate good for buying a Grade I tire, or, if such a tire is not available, he may obtain a certificate for a Grade III tire (used tires or new tires made principally from reclaimed rubber). The remaining supply of Grade III tires will go to persons doing occupational driving of a less essential character.

However, since there are not enough new tires to meet all essential needs, boards will have to do a most careful screening job in considering applications filed by persons eligible under the new program. Drivers doing work most essential to the war effort, the public health, and safety will have to come first.

"Boards have been doing a big and vastly important job in seeing the country through this tire crisis," OPA Administrator Chester Bowles said. "Now they must do an even bigger one.

"It is hard to set up a 1-2-3 definition of which driving is most essential, next essential, and least essential. Until the time comes that new tire inventories reach a volume large enough

to meet all essential needs, boards will have to consider, first, the tire quotas given them, and then parcel out the tires according to their understanding of local conditions and national needs.

"Fortunately, tire rationing is the oldest OPA rationing program. Local boards have learned a lot about what is necessary driving and what is not. We are confident that they will handle this new job, and that such tires as are available will go where they are needed most.

"We are trying every day to get away from having all the decisions made in Washington. The thing we are asking local boards to do now represents one of the biggest steps taken so far to give final authority to the OPA people who are right on the ground. We are trying to help the boards by giving them a list of 'essential' drivers, but we are not listing them in order of importance. That is a decision which the boards will make."

This list of classifications, inclusion in any one of which entitles the applicant to consideration by the board for Grade I tires, subject to quota limitations, but does not in itself entitle him to a new tire certificate, includes:

- Transportation of workers to, from, or within essential establishments.
- Construction, repair, and maintenance workers—in performance of occupation.
- Farmers transporting farm products and supplies.
- Transportation of farm workers, fishermen, seamen, marine workers, radio broadcast engineers, and technicians.
- Transportation of persons engaged in recruiting or training workers; maintaining industrial relations.
- Delivery of U. S. mail.
- Wholesale delivery of newspapers and magazines.
- Licensed physician, surgeon, dentist, osteopath, chiropractor.
- Official travel of government officers or employees—home-to-work travel is not official.
- Persons transporting groups (four or more) of students, teachers, or school employees—travel to or from regular place of study.
- School teachers or school officials—performance of school duties must require regular travel to more than one educational institution.
- Midwife, veterinarian, public health nurse, or embalmer—in performance of professional duties.
- Ministers and religious practitioners—in performance of religious duties.
- Members of Armed Forces on authorized travel.
- Full-time social workers—in performance of duties.
- Volunteer firemen, Red Cross workers, member of ration board, selective service board, U. S. Defense Corps., etc.—for travel on official business only.
- Transportation of nonportable photographic equipment—must be by a person regularly engaged in such activity.

OPA summarized as follows the tire supply situation that calls for the change:

"About a million and a half used passenger tires are left for rationing. Since tires of this type have recently been rationed at the rate of about 850,000 a month, it is no longer possible to continue the old program and still keep essential cars in operation.

"The Office of the Rubber Director has advised OPA that because of heavy military needs, together with shortages of essential materials, equipment and man power, manufacture of new passenger tires during the present quarter will not permit a national monthly quota in excess of 750,000.

"This 750,000 per month for the entire country is not large enough to give all occupational drivers new tires as needed.

"Therefore, tires will be rationed as follows:

"First, new tires (Grade I) will go to the most essential drivers. They may also get ration certificates for Grade III tires if new ones are not available.

"Second, used tires and 'war' tires (Grade III) will go to less essential drivers.

"Third, drivers who do not use their cars in connection with their work will continue to be ineligible for tires of any sort. This means that in the East no driver holding an 'A' card is eligible to buy tires of any sort. In other parts of the country, where the 'A' ration contains some gasoline for occupational use, 'A'-card holders who can show essential occupa-



tional driving may be able to obtain tires. Drivers not eligible for times of any sort must continue to rely on recapping to meet their tire needs."

The following data, showing why it is necessary to put tire rationing on an occupational rather than a mileage basis, were supplied by OPA:

"The mileage rationing program began Dec. 1, 1942. At that time, three grades of tires were available for rationing: Grade I, first-quality new tires made of prewar rubber; Grade II, lower quality new prewar tires; Grade III, used tires or new 'war' tires made of reclaimed rubber.

"All motorists were eligible for tires of some sort. To conserve rubber, tire eligibility was based on the driver's monthly mileage allowance, with the best tires (Grade I) going to those who had the highest gasoline allowance, the next best (Grade II) to the next highest mileage group, and, finally, with used and 'war' tires going to 'A' card holders and low-mileage occupational drivers.

"By May 1, 1943, the lower quality new tires (Grade II) had virtually disappeared from the market. On that date, therefore, the remaining Grade II tires, along with the reclaimed rubber 'war' tires (which were put into Grade II on April 1) were included in Grade I, and persons formerly eligible for Grade II tires were made eligible for Grade I tires. This left the Grade III tires (now used tires only) for 'A' card holders and drivers using their cars for low-mileage occupational driving.

"Soon it was plain that stocks of tires were no longer sufficient to provide for the needs of all drivers. On July 1, 1943, therefore, eligibility for the Grade III (used) tires was restricted to drivers using their cars in connection with their work or in driving to and from work. 'A' card holders, unless they were doing occupational driving, no longer were eligible for tires of any sort.

"Now the supply of Grade III tires, a class which, since Dec. 1, 1943, has again included tires made of reclaimed rubber as well as used tires, is so far diminished that the needs of many persons eligible for them cannot be met. The inventory of synthetic tires has not yet reached large enough volume to take up the slack. Since it is imperative to keep war-essential transportation moving, it is now necessary to abandon present 'mileage' standards and change over to 'occupational' standards. Under the change, drivers who have been eligible for Grade III tires only may now get Grade I tires if they use their cars for highly essential occupational driving."

"Since there are not enough new tires to go around," OPA said, "it is obvious that all occupational drivers will not be able to get new tires. Drivers in the 'highly essential' category, however, must have tires. The successful prosecution of the war effort demands that these drivers be kept in operation even though it may be at the expense of less important operators driving high mileages. Boards, of necessity, will have to operate within the very limited quotas given to them."

(Amendment 67 to Ration Order 1A, Tires and Tubes, effective Feb. 1, 1944.)

### Photographs of Orthodontic Models

It has been noted in the past in making cuts from photographs of orthodontic models that the white in the plaster does not reproduce well in half-tone cuts. It has been suggested by engravers that if something could be added to the plaster, such as light yellow ochre, and mixed with water before the plaster cast is made, the model would photograph very nicely and would make a very much better appearing cut for printing purposes.

### Southwestern Society of Orthodontists

The Southwestern Society of Orthodontists held its annual meeting February 28 to March 2, 1944, in Shreveport, Louisiana.

The following program was given:

"A Philosophy of Orthodontic Treatment," Charles H. Tweed, Tucson, Arizona.

"The Technic and Type of Appliances Used in the Tweed Philosophy of Orthodontic Treatment," by Dr. Tweed and study group.

"Dental Abnormalities as Found in the American Indian," Clarence Webb, Shreveport.  
Case Report: "Employing the Use of the Twin Arch Mechanism," Dan C. Peavy, San Antonio, Texas.

"Practical Orthodontics," W. R. Alstadt, Little Rock.

"Three Treated Cases—Two With Four Bicuspid Extraction and One With No Extraction," E. B. Arnold, Houston.

"Further Report on the Case of Hereditary Mesioclusion Complicated by Endocrin Dysfunction," Brooks Bell, Dallas.

"Some Useful Things That Help in the Office," H. B. Bolt, Enid.

"A Method of Replacing Missing Anterior Teeth on Lingual Arch Using Acrylic Resin," Donald A. Closson, Kansas City.

"A Time Saving Idea Requiring Only One Visit and One Impression for Record Model, Band Technic, and Appliance Construction," D. P. Comegys, Shreveport.

"Table Clinic," W. E. Lipscomb, Houston.

"Twin Arch Technic, With Modifications," Dan C. Peavy, San Antonio.

"How Would You Treat This Case and What Is Your Prognosis?" Mark H. Perrin, Topeka.

"Variations in Twin Arch Technic," H. E. Rice, Colorado Springs.

"Technique of Molar Tube Alignment," John W. Richmond, Kansas City.

"A Cross Bite—Its Psychosensory Effect," Homer B. Robison, Hutchinson.

"Rotation of Maxillary Molars," C. T. Rowland, San Antonio.

"Construction of Acrylic Bite Plane," P. G. Spencer and A. C. Bostick, Waco.

"Team Play in Orthodontics," Harry H. Sorrels, Oklahoma City.

"Case Reports Using Edgewise Mechanism," A. P. Westfall, Houston.

"McCoy Appliances," Louis S. Winston, Houston.

Case Report: "Treatment of the Impacted Cuspid," S. H. Johnston, Austin, Texas.

"A Symposium on the Business Side of Orthodontics," by Drs. Nat Gaston, Guy Gillespie, Claude Koch, Oren McCarty, Harry Sorrels, and W. B. Stevenson.

The Southwestern Society of Orthodontists was founded at Dallas, Texas, in 1920. At the suggestion of Dr. T. O. Gorman and Dr. T. G. Duckworth of San Antonio, the following men met at the Adolphus Hotel to organize the Southwestern Society: Dr. O. E. Busby, Dallas; Dr. W. T. Chapman, El Paso; Dr. A. B. Conly, Dallas; Dr. T. G. Duckworth, San Antonio; Dr. T. O. Gorman, San Antonio; Dr. C. M. McCauley, Dallas; Dr. P. G. Spencer, Waco.

The Society was formed with Dr. T. O. Gorman, President, and Dr. W. T. Chapman, Secretary-Treasurer.

It was voted to hold the first annual meeting in Dallas in 1921. Dr. T. G. Duckworth was program chairman and arranged for Dr. Albert H. Ketchan to appear as the first guest clinician.

### American Board of Orthodontics

The 1944 meeting of the American Board of Orthodontics will be held at the Edgewater Beach Hotel, Chicago, Illinois, April 23 and 24. Orthodontists who desire to be certificated by the Board may obtain application blanks from the Secretary, Dr. Bernard G. deVries, 705 Medical Arts Building, Minneapolis, Minn.

### New York Society of Orthodontists

The annual meeting of the New York Society of Orthodontists was held March 6 and 7, at the Waldorf Astoria Hotel in New York.

The program was as follows:

"The Surgical Correction of Mesioclusion," Samuel Hemley, New York, N. Y.

Adapting the Johnson Procedure to the Plain Labial in Certain Class II, Division 1 Cases," Walter R. Bedell, Poughkeepsie, N. Y.

"The Formation of Cementum," William Lefkowitz, New York, N. Y.

"Formal Discussion on Dr. Lefkowitz' Paper," Leuman M. Waugh, New York, N. Y.

"Development of the Dental Height," Moses Diamond, New York, N. Y.

President's Address: "Acrylic and Vulcanite Removable Appliances," Jacob Stolzenberg, Brooklyn, N. Y.

"Tooth Shifting After Extraction in Absence of Orthodontic Guidance," J. A. Salzmänn, New York, N. Y.

"An Approach to the Treatment of Malocclusion, More Particularly Class II, Division 1, Using the Atkinson Universal Technic," Carl P. Cline, Norfolk, Va.

"Edgewise Arch Mechanism and Some Present-Day Trends," William McLain Thompson, Jr., Pittsburgh, Pa.

"A Philosophy of Orthodontic Treatment," Charles H. Tweed, Tucson, Arizona.

"Surgical and Orthodontics Correction of Prognathism," A. W. McClelland, Montreal, Canada.

"Problems in the Dental Treatment of Jaw Injuries," Lt. Col. Gerald Franklin, Canadian Dental Corps, Ottawa, Ontario, Canada.

Formal Discussion on Lt. Col. Franklin's Papers: Lt. Col. James M. Mullen, D.C., Station Hospital, Mitchell Field, New York.

Clinics—Supplementing Papers.

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### Thomas P. Hinman Mid-Winter Clinic

The Thomas P. Hinman Mid-Winter Clinic will be held at the Municipal Auditorium, Atlanta, Ga., March 26, 27, 28, 1944.

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### Notes of Interest

Dr. Adelbert Fernald has closed his office at 29 Commonwealth Avenue, Boston, Massachusetts, and is devoting all his time to his Exeter, New Hampshire, office at 87 Water Street, where practice is limited to orthodontics.

Dr. Cecil G. Muller wishes to announce the change of location of his office to 1516 Medical Arts Building, Omaha, Nebraska. Practice limited to orthodontics. Phone, Harney 2123.

Dr. Alice Tweed announces her association with Dr. Charles H. Tweed, in the Valley Bank Building, Tucson, Arizona. Practice limited to orthodontics.

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\*The Journal will make changes or additions to the above list when notified by the secretary-treasurer of the various societies. In the event societies desire more complete publication of the names of officers, this will be done upon receipt of the names from the secretary-treasurer.



**Washington-Baltimore Society of Orthodontists**

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\*The Journal will publish the names of the president and secretary-treasurer of foreign orthodontic societies if the information is sent direct to the editor, 8022 Forsythe, St. Louis 5, Mo., U. S. A.

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